Excavating Engineer

founded 1905

AUGUST 1960

Rich, brown Arkansas topsoil is scooped up in 15-yd. bucketloads by this walking dragline cutting a flood control channel on the St. Francis River. A story begins on page 9.

You'll wonder where the friction went –

This picture demonstrates how friction-free the Bucyrus-Erie 14-B ball-bearing swing circle is. One man swings the entire machine easily by pushing on the hoe boom. What's more, the 14-B's swing circle is adjusted, lubricated and sealed at the factory — requires little additional maintenance.

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Excavating Engineer

founded 1905

South Milwaukee, Wisconsin

August 1960

Volume 54 No. 8

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DUMPTOR CUTS HAUL TIME IN HALF — Matched against another leading rear dump unit, DUMPTOR recently shaved haul time in half for one operator. Job involved a 603-ft. one-way haul, 204 feet was down a 20% grade. Average trip time: 1 minute, 38 seconds.

DUMPTOR SPEEDS NARROW ROAD CUT — George Brewster & Sons, Inc., use DUMPTORS to haul rock for construction of approach ramps to lower level of George Washington Bridge. In places cut is so narrow it prohibits turn-around operations — no problem for dual-controlled DUMPTOR.

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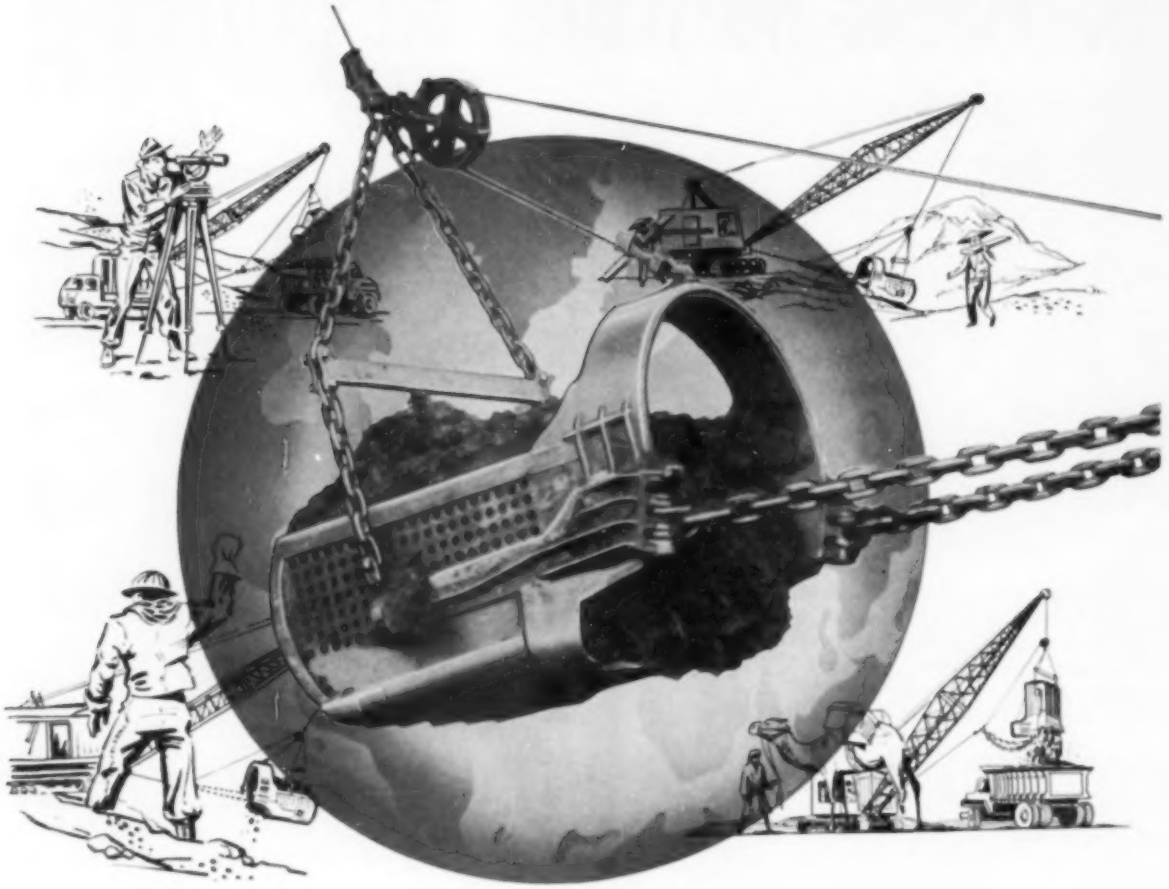

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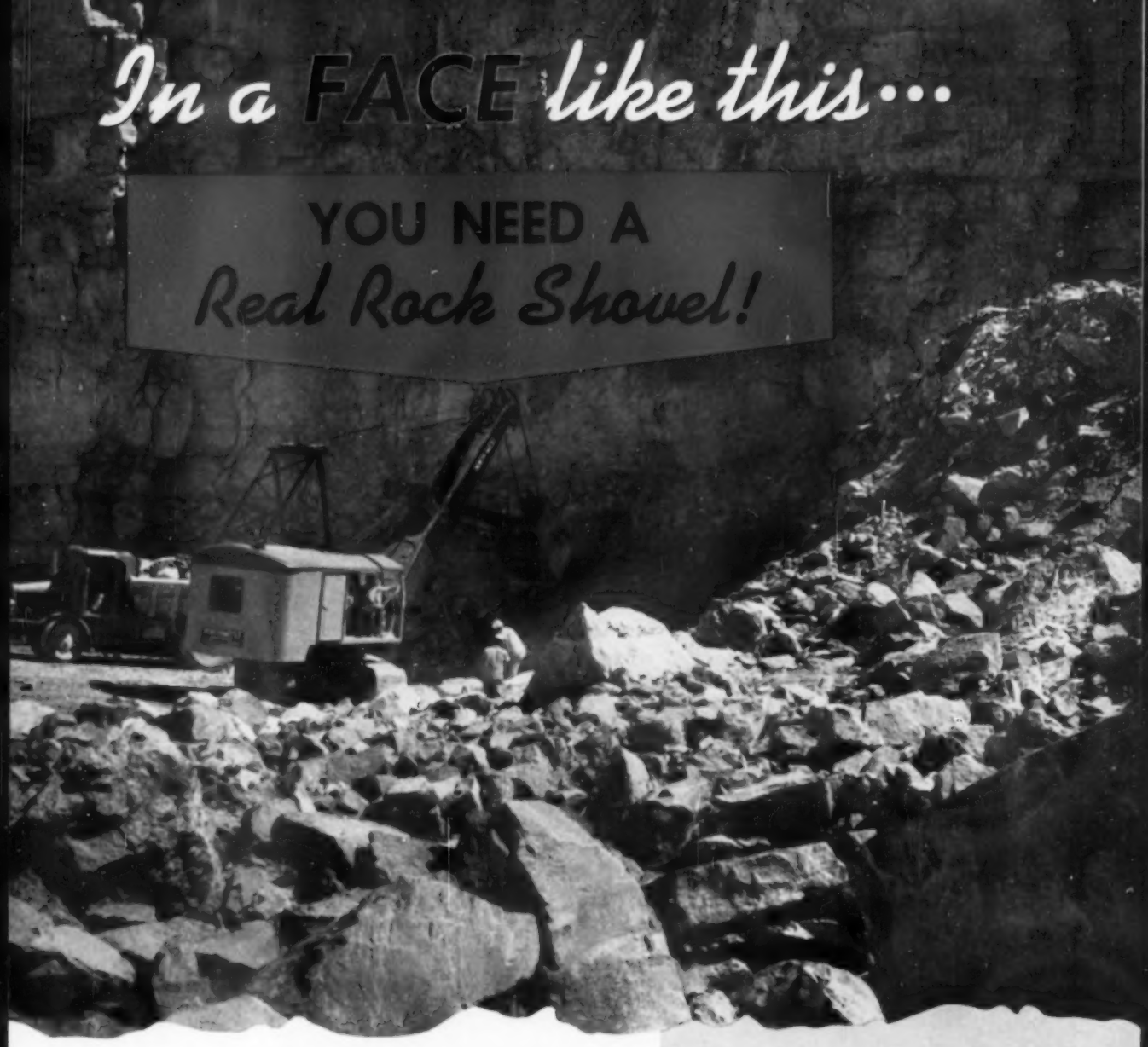

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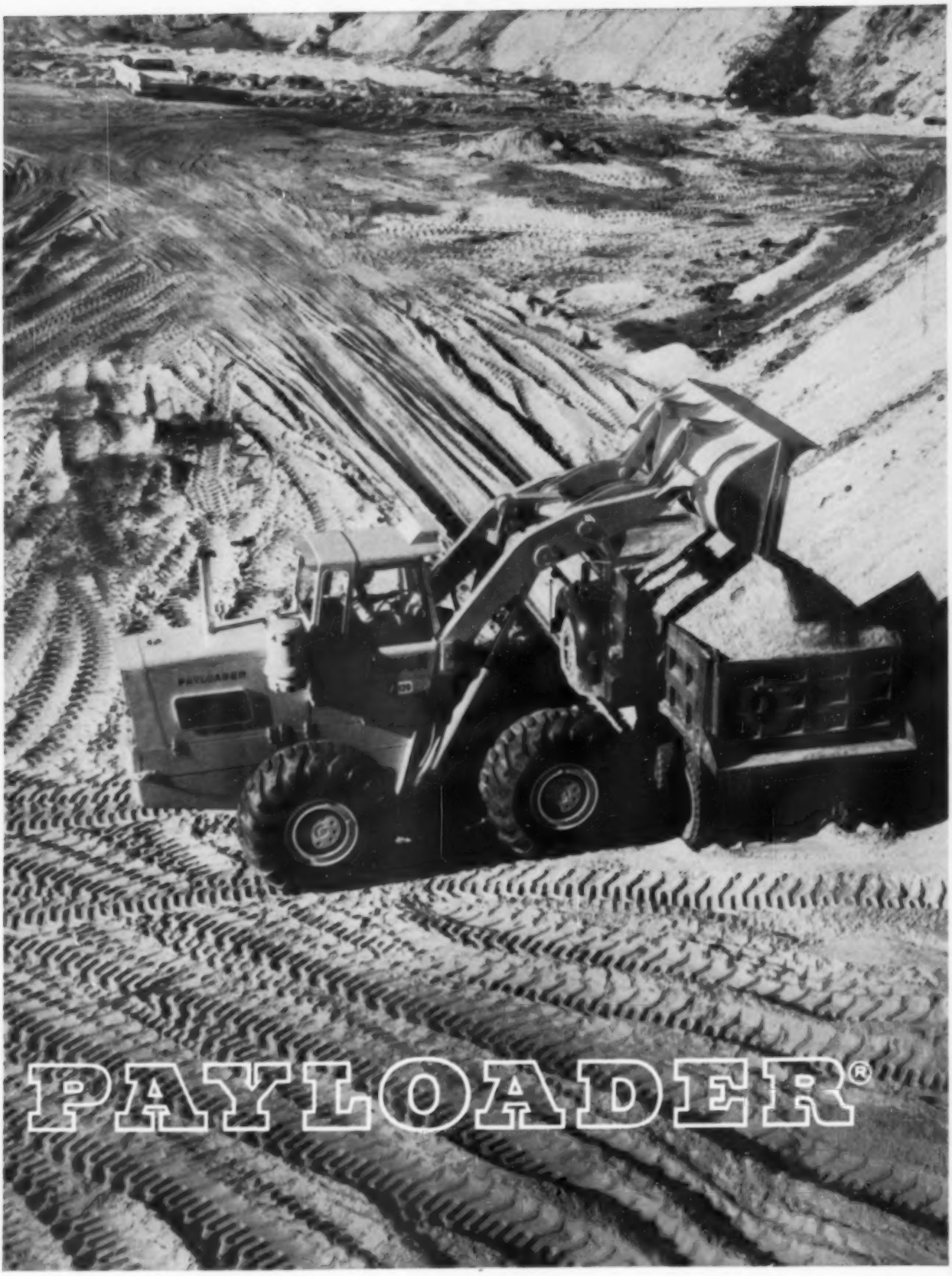
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Owner Says: "The H-120 is fast and maneuverable, does numerous jobs that save us time and extra equipment."

Operator Says: "Jobs just don't come too big for this machine. Has power to spare. The H-120 gives maximum traction with no wheel spin. I like the comfort and ease of operation. It is a well balanced machine."

Operator Says: "The H-120 has unmatched pry-out power and more digging power than any other large rubber-tired loader. The machine never runs hot no matter how hard the digging gets. It has good load-carrying balance."

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Owner Says: "The additional capacity of the H-120 and its faster load-out speeds has cut our basic hauling equipment needs in half on the pit-to-plant short haul operation. The high reach of the bucket gives evenly distributed loads which makes it easier on the hauling equipment."

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Photographs by courtesy of the National Coal Board, Opencast Executive.

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AUGUST 1960

More than One Way to Dig a Ditch

Contractors choose contrasting methods of excavation to dig a floodway that will protect some of Arkansas' richest farmlands from the disastrous backwash of the Mississippi.

TWO of the Southland's biggest earthmoving contractors have proved on a massive scale that there's more than one way to dig a ditch.

Working a few miles apart in eastern Arkansas are Atlas Construction Co., of Vidalia, La., and Kenyon Construction Corp., Port Allen, La. On separate prime contracts, both firms are digging segments of a new interior drainage canal which, together with part of the present St. Francis river channel, will ultimately provide drainage for the lower St. Francis river basin.

Both companies are cutting new channels to the same dimensions—130-ft. bottom width and 1 on 3 side slopes. Depth of the cut varies with the surface terrain and ranges down to 41 feet.

Close Bids

The two contractors' successful bids on the two jobs were close—within a half-cent per yard—but their methods of doing the work were quite different when *Excavating Engineer* photographed the job. Atlas tackled its 5-mile long cut with two medium size draglines and a hydraulic dredge. Kenyon planned its job as dragline work only, and assigned two large walkers to the task, one of which is the biggest dragline in the lower Mississippi valley. Army Corps of Engineers officials of the Memphis (Tenn.) district approved both methods of operation.

Both new channels were designed to make the best possible use of the natural terrain by following existing ditches, bayous and lakes where these are close to a straight line route. Each of the two channel projects takes its name from the principal natural body of water that it follows. The Atlas job is known as the Grassy Lake Cut-off; Kenyon's project is called Round Pond Cut-off.

The Atlas contract calls for approximately 7,078,000 cubic yards of excavation and was awarded on a bid of 14.93¢ a yard. Work on the five-mile cut started June 6, 1959, and

Here is the dredge ladder of the *Baldwin*, an 18-in. diesel-electric cutterhead unit used in conjunction with medium-size walking draglines on the Atlas Construction Co. job.

completion is scheduled for February 1961.

From its fleet of walking draglines, Atlas chose a Bucyrus-Erie 200-W and a Bucyrus-Monighan 5-W for the Grassy Lake job. The 200-W, with its 6-yd. bucket swinging from a 150-ft. boom, is the workhorse of this team and handles the major share of channel excavation. The machine's original engine, a 400-hp Cooper-Bessemer 5-cylinder diesel, powers the 14-year-old dragline.

The 5-W walker carries a 125-ft. boom and a 5-yd. bucket. A new Caterpillar D397 V-12 diesel engine drives the machine. The 5-W was transported to the job site by truck from its last job in northern Arkansas. Dismantling the dragline, hauling it and erecting it on the new job was all completed in three weeks, according to Rex F. Bingham, general foreman for Atlas on the Grassy Lake project.

The bigger Atlas machine came by barge from the company shops at Vidalia, which is on the Mississippi across from Natchez, Miss. The machine was barged up the Mississippi and St. Francis rivers intact.

Yardage output of the machines on the Grassy Lake job varies greatly with the terrain. Where the new channel follows an existing lake or ditch, there's very little digging and lots of walking for the machines. But where the terrain is high and level, as it is on most of the route, there's lots of digging and few moves.

One characteristic of the channel design makes both the Grassy Lake and Round Pond jobs tough ones. Corps of Engineers designers determined that spoil banks must be set back a full 100 feet from the edge of the new channel, and must be no more than 20 feet high near the channel, with a gradual rise (1 on 20) permitted toward the far side of the pile. This setback is necessary to keep the weight of massive spoil banks from weakening and caving the newly cut channel slopes.

Supervising the dredging is H. L. Hubbard, general superintendent for subcontractor Missouri Valley Dredging Co. Here Hubbard checks *Baldwin's* 18-in. discharge line.

Spoil Cast

On the higher ground, where the cut ranges to 40 or 41 feet in depth, the amount of spoil is so great that it must be cast well back to maintain the 100-ft. berm. The 200-W must take full advantage of its 150 feet of boom to get the spoil far enough back, and full 180° swings are the rule rather than the exception.

Digging under these conditions presents a challenge to job superintendents. With careful planning of the work and precise spotting of the machine, the dragline operator may be able to shave a few degrees off the swing or make more passes between moves. On projects the size of Grassy Lake and Round Pond Cut-offs, these economies can accumulate to appreciable savings in machine time and result in completing the work days sooner.

Sometimes the two Atlas machines must work in tandem, rehandling a portion of the spoil. In other areas the smaller walker opens the ditch and rehandles spoil. But in many cuts the 200-W alone can handle the excavation without rehandling because 20 to 25% of the material (the portion below water level) is left for the dredge.

Building dikes to contain dredge spoil is one of the tasks of the 5-W. The dikes are 6 to 12 feet high and are built against the far side of the dragline spoil banks which serve as one side of the settling basins. The diked areas are about 250 feet wide and average about 2,000 feet long.

On this job the 200-W always works from mats; the 5-W, rarely. Auxiliary equipment on the Grassy Lake job is limited to two Cat D7 dozers which clear right-of-way and move mats for the walking draglines. Maintenance equipment on skids is also moved by the dozers.

Bingham does not follow a strict

Excavating the top portion of the channel on the Grassy Lake cut-off is this Bucyrus-Erie 200-W with 6-yd. bucket on a 150-ft. boom. Also on the job is a smaller 5-W.

maintenance schedule, but rather "plays it by ear." Engine lubrication and maintenance are geared to hours of operation according to the manufacturers' recommendations. But hardfacing of buckets and teeth and other adjustments and maintenance on the draglines is performed when Bingham, a veteran of many river channel jobs, decides it is necessary. This flexible schedule is made necessary by the highly variable digging conditions in the various materials encountered.

Generally the material is clay, silt, and sandy silt, and a layer of coarse, abrasive sand is often encountered near the bottom of the cut. Material being handled ranges from 6,000 to 38,000 cubic yards per station.

The Atlas draglines are manned in three 8-hour shifts a day, seven days a week. "We stopped for Christmas last year—that's all," Bingham reported.

Dredge work is subcontracted to Missouri Valley Dredging Co. of Omaha, Neb., which is doing the work with an 18-in. diesel-electric cutterhead dredge named *Baldwin*. Built by the Morris Machine Works, Baldwinville, N. Y., the *Baldwin* has a General Motors 278A V-16 diesel turning its generator. Its Westinghouse motor is rated at 1,000 hp.

The *Baldwin* moves about 12,000 to 15,000 cubic yards a day. With from 4,000 to 4,500 yards per station to be moved, the dredge completes about one mile of channel a month. Total dredge work on the subcontract will run to more than 1.6 million yards. The dredge trails more than 500 feet of discharge line, and pumps the material over the top of the big dragline spoil banks into the settling ponds. Water is returned to the channel ahead of the dredge through drainage ditches at the upstream end of each pond.

Similar Job

Kenyon's Round Pond Cut-off job, like the Grassy Lake project, takes advantage of the existing terrain to keep excavation to a minimum. On one stretch of 4,800 feet there was no excavation, and the Kenyon contract required only clearing trees and brush from the banks. But the channel is a new cut for most of its 9.3-mile length.

Kenyon bid the Round Pond Cut-off at 15.4¢ a yard for an estimated 10 million yards. Earthmoving started March 14, 1959, and completion is

This portion of Kenyon's Round Pond job partly follows a natural drainage ditch. The U.S. route 70 bridge shown was built earlier to conform to the new channel dimensions.

This aerial view shows a portion of the completed Round Pond interior drainage channel which has a bottom width of 130 feet. Here a plug was left at the site of two future bridges which will carry a highway and the Rock Island Railroad across the channel.

scheduled for Feb. 11, 1961. Kenyon started fast and stayed well ahead of schedule.

Rather than making a partial cut and leaving a portion of the excavation for a dredge, Kenyon put two long-boom, high-capacity walking draglines on the Round Pond channel. Both have adequate reach to cut half of the channel from each side and cast the spoil far enough to maintain the 100-ft. berm.

Kenyon's two machines represent two distinct generations of excavator design. One is a Monighan 6160 that has seen almost a quarter-century of service; the other is a Bucyrus-Erie 480-W that is less than two years old. The Monighan swings a 10-yd. Esco bucket on a 160-ft. boom; the 480-W, a 15-yd. Bucyrus-Erie BM bucket on a 160-ft. boom.

A Fairbanks-Morse diesel powers the drums of the 6160, and a Caterpillar 340 diesel drives the generator that powers the electric swing motor. The 480-W is powered by a 1,000-hp Cooper-Bessemer diesel which drives the drums through a Bucyrus-Erie transmission and the swing motors through a generator and exciter.

Barge Travel

The 480-W, which has a working weight of 750 tons, was shipped intact, boom and all, by barge from McGehee, Ark. There the machine completed its initial job last year, and walked seven miles (at about one mile a day) to the nearest barge landing. It walked aboard the barge under its own power, and, after waiting a week for high water, was towed down the Boeuf and Ouachita rivers to the Mississippi, up the Mississippi and St.

Bottling Up the Backwash

SCENE of the Round Pond and Grassy Lake projects, the lower St. Francis river valley contains some of the richest farm land in Arkansas. The valley extends from the banks of the Mississippi on the east to a chain of gently rolling hills, called Crowley's Ridge, on the west. The St. Francis river hugs the west side of the valley close to the ridge in a stream bed that geologists say was carved by Old Man River himself countless centuries ago.

Nature enriched the soil of the lower St. Francis valley through repeated alluvial deposits whenever the Mississippi took a notion to spill over its banks. Early settlers found the fertile flood plain ideal cotton country, but the river did not always cooperate with man's efforts and sometimes the inundations came at harvest time rather than at plowing time.

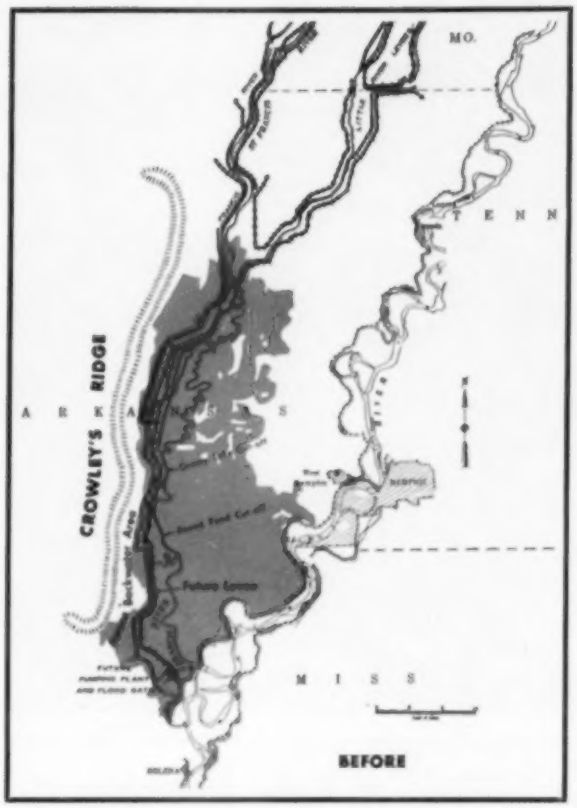
A mighty levee on the west bank of the Mississippi provided the solution for farmers in the upper St. Francis valley, but in the lower valley flood water could still pour from the Mississippi into the mouth of the St. Francis and across the lower valley. It is this 10 to 30-mile wide backwater area of the valley that the present project will help.

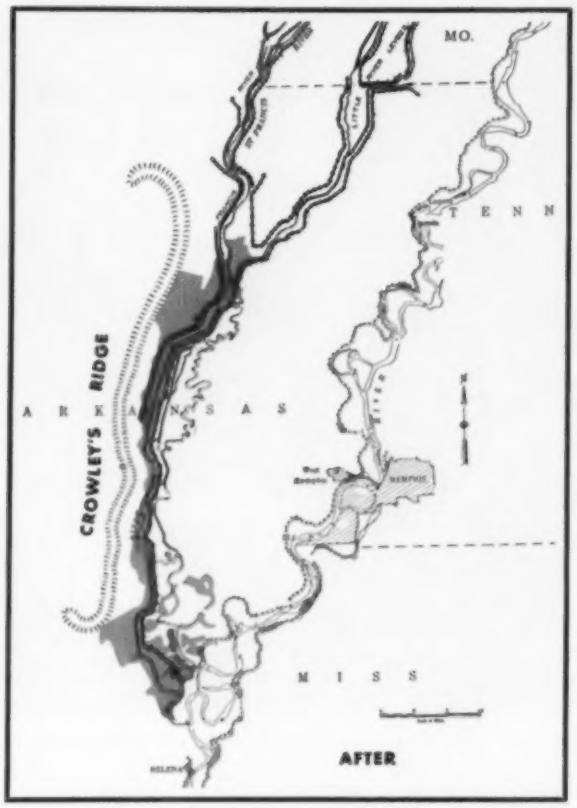
Agencies Cooperate

Drainage and flood protection in the area are under the jurisdiction of the St. Francis Levee Board of Arkansas. The board has worked with the Memphis district of the U. S. Army Corps of Engineers on many improvements in the upper reaches of the valley, and the two agencies cooperated to devise a plan to protect the backwater area.

The present activity at Grassy Lake and Round Pond, together with other channel jobs on the St. Francis, will in effect give the river two separate channels by connecting the outer reaches of its meandering bends. The next major phase of this long term project will be to build a levee between these two channels. The new levee will be joined to the existing west bank levee of the Mississippi near the confluence of the two rivers.

This arrangement will confine the flood stage backwater between the new levee and Crowley's ridge in a new narrow St. Francis flood-





(Left) Color overlay on map of the St. Francis Basin shows the actual extent of backwater during the 1937 flood. (Right) This is the area that would be inundated during a similar highwater after completion of the present Corps of Engineers project.

way. The other, smaller channel will provide drainage for the lower valley after it is sealed off by the new levee. Grassy Lake and Round Pond Cut-offs are both parts of this interior drainage system. The key to the interior drainage of the valley, and the final link in the whole St. Francis Basin project, will be a mammoth pumping station that will lift water from the lower valley over the new levee.

This pumping plant, which has not yet been designed in detail, will include a flood gate to permit a natural flow of interior drainage out of the valley when the Mississippi and St. Francis are at normal levels. When a flood stage approaches, the flood gates will be closed and the big pumps will take over to dispose of the interior drainage.

Much of the work on the new St. Francis river floodway channel has been completed. The biggest new cut in this part of the project was the Madison to Marianna canal completed four years ago by Standard Dredging Co., Inc., New York, N. Y. With 22.5 million cubic yards of excavation in 14.5 miles, this was one of the biggest earth-moving jobs in Arkansas history. The cut has a 180-ft. bottom, 1 on 3 side slopes; and a 35-ft. average depth.

Huge Area

Complete protection of the 250,000-acre backwater area from floods will not be achieved until the whole project is completed. New appropriations are required for each phase of the work. But in the meantime, the new channels now being carved help improve drainage of the backwater country which is already criss-crossed by a series of drainage ditches.

Chief engineer for the St. Francis Levee Board of Arkansas is Burrell Fair.

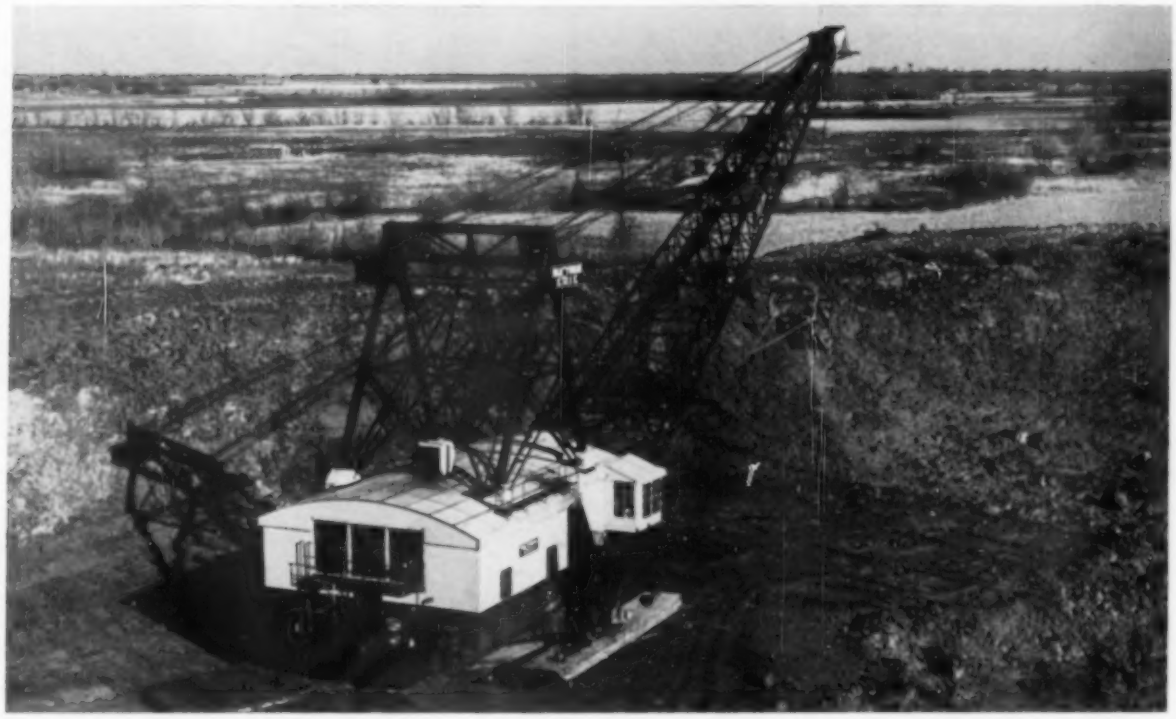
Francis rivers to the site of the Round Pond Cut-off. The trip took four days.

The barge was landed exactly where the new channel was to begin, so the big dragline walked off the barge and started digging.

Usual practice on the Round Pond project calls for the two walkers to dig from opposite sides of the cut, but this is varied with the varying terrain. Combined output of the two machines ranges from 500,000 to 740,000 cubic yards per month.

Although the 480-W has 50% more bucket capacity than the 6160, the newer machine moves about 100% more material than its venerable ancestor. Machine Superintendent Jesse Prewitt attributes this higher production to the greater power of the 480-W which results in faster filling of the bucket and faster swinging, and to various other design improvements that contribute to swifter cycles.

On the job an HD-21 dozer accompanies the 480-W, and an HD-16 goes with the 6160 to clear work areas. For about two months during



Unusual view of Kenyon's diesel-powered 480-W was taken from the boom point of the Monighan 6160 which works with it on job.

the worst of the winter weather, the machines were forced to work from mats which were moved about by the dozers. In the latter part of February, the mats were finally abandoned.

Meeting the 100-ft. berm requirements, and in a few areas 120 or 130-ft. berm, is also a major problem on the Round Pond Cut-off. The Kenyon machines can manage it without rehandling, but it slows production compared to less exacting channel jobs. The digging at Round Pond is also tougher than that experienced by the 480-W on its maiden job at McGehee, chiefly because of the layer of coarse sand that underlays the St. Francis River area.

The sand is usually encountered in about the bottom 10 to 15 feet of the cut. Digging in clay and silt, dragline buckets are good for about 30 days between hardfacing treatments. In sand, the buckets have to be changed about every ten days. The job of hardsurfacing the big buckets' lips, teeth and chains, together with routine maintenance work, keeps one welder and a helper busy full-time on the Kenyon spread.

The Kenyon draglines are manned by three-man crews (an operator, an oiler and a helper) on three 8-hour shifts around the clock, seven days a week. Also on the payroll are three engineers, two dozer operators and one spare man for each machine.

Supervisory personnel include General Superintendent S. F. Lewis, and Machine Superintendent Jesse Prewitt on the 480-W and N. L. McConnell on the 6160. Howard Kenyon, president of Kenyon Construction Co., manages the project personally.

For Atlas Construction Co., Rex F. Bingham is general foreman and machine foreman on the 200-W. A. M. Dawsey is foreman on the 5-W, and L. R. Lazarus is project engineer.

This view is from the operator's cab on the 480-W. It swings a 15-yd. Bucyrus-Erie 8M bucket from its 160-ft. boom. It is powered by a 1,000-hp Cooper-Bessemer diesel.

MOVE UP to an 88-B

SERIES TWO

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Big Tows Find Room In New Meldahl Locks

Two locks, 600 feet and 1,200 feet long, will handle long barge tows without breaking them up or slowing them down. A $2,080,239 cofferdam shuts out the Ohio River from a 22-acre dry construction site.

The 6-yd. Lima dragline is mounted on 22-ft. crawler tracks with 54-in. pads to give it stability while working on the treacherous sand behind the cofferdam.

(Above) Upstream view shows excavation within the cofferdam. (Below) View taken later from the same position shows concrete being poured for the lock walls.

by L. H. Houck

ONE of the most important steps in the modernization of the Ohio River will take place in mid-1964 with the completion of Captain Anthony Meldahl Locks and Dam. The new facility, 36 miles above Cincinnati and 436 miles below Pittsburgh, is located near Chilo, Ohio, and will greatly reduce towing time between Pittsburgh and Louisville.

Meldahl, named after a famed master river pilot, is part of a long-range program of the U. S. Army Corps of Engineers which was authorized in 1909 by section six of the River and Harbor Act. The program will replace 46 present structures with 19 modern, high-lift, long-pool dams and locks. Meldahl alone replaces four dams—numbers 31, 32, 33, and 34. It is a connecting link in a modern 350-mile navigation system from Point Pleasant, W. Va. to Louisville.

The new fast-time locks will handle long tows without breaking them up into sections. There will be two locks —one 110 feet wide and 1,200 feet long, and one 110 feet wide and 600 feet long. The larger chamber is on the riverward side to better accommodate long tows. Speed is necessary at this site which handled more than 21 million tons of river traffic in 1957.

Preliminary work on the job began in May 1958 with the awarding of a $2,080,239 contract for cofferdam construction to Peter Kiewit Sons Co.,

Omaha, Neb. This job, completed in June 1959, consisted of 52 temporary and four permanent cells. It is 3,809 feet long along the center line, and 2,456 feet along the base line, up and down stream. Seventy-six feet high, it required 1,100,000 lineal feet (or 19,000 tons) of interlocking sheet steel piling.

The cofferdam shut out the Ohio River from a 22-acre space, which was to be the site of the two Meldahl locks and the main excavation portion of the next contract. The cells of the cofferdam were filled with 254,000 cubic yards of pervious materials and the tops were capped with concrete to provide a roadway and machine base.

Prime contract for construction of the locks, guard walls and operations building was awarded to Groves Ventures Co., sponsored by S. J. Groves & Sons Co. of Minneapolis, Minn., for $25,439,369. Work was started in March 1959.

Groves subbed the guard wall structures to the Dravo Corp., of Pittsburgh. The job consists of sheet steel piling cofferdam cells, with connected cells on the lower walls, and unconnected cells on the upper. The open type of construction on the upper guard walls makes it easier for large tows to enter the locks. To handle the job of driving steel piling to bedrock, filling cells with tremie and placing concrete on the cell tops, Dravo moved in a number of large-mounted American steam Whirlers.

Circular cells on the lower or downstream guard wall are constructed of interlocking sheet steel piling driven to bedrock. Sand is removed from the inside to a specified depth by clamshell and bearing piles are driven to rock. Concrete is poured by the tremie method to a predetermined level. The guard walls and guide walls are on bearing pile, while the guard wall pile is enclosed in sheet pile cells. The upper guide wall has a double sheet pile cut-off wall.

Rock Foundation

The lock chamber walls will be founded on rock, since this type of construction figured out more economical than bearing pile and cut-off wall. When the locks are completed, the 52 temporary cells of the cofferdam built by Kiewit will be removed, leaving the permanent cells connected to the upper and lower guard walls. The dam will be a 1,734-ft. structure with 12 tainter gates with individual hoists and will join the permanent lock structure at its upstream end and connect with the Kentucky side of the river.

The excavation portion of the Groves contract, being carried out inside the dewatered area behind the cofferdam, consists of 1¾ million cubic yards of common excavation (sand and clay), and 1,440 cubic yards of rock. Daily production was between 1,000 and 1,250 cubic yards of common excavation per hour.

For excavating this material, Groves moved in a Lima model 2400 combination shovel-dragline with a Lima-Hamilton diesel engine. The machine was mounted on 22-ft. crawler tracks with 54-in. wide pads which gave it reasonably good stability in the treacherous wet sand. It had a 110-ft. boom and swung a 6-yd. Amsco bucket for dragline work; later it used a 6-yd. shovel dipper.

C. W. Kerns, excavation superintendent for Groves, recently spent two years in Vietnam erecting a fleet of 25 excavators.

Second dragline in the pit was a Northwest 95 with a 90-ft. boom and a 3-yd. Hendrix bucket. These machines loaded into a fleet of 12 Euclid bottom dumps with 20-yd. heaped capacities, and five 15-yd. heaped Euclid bottom dumps.

Part of this fleet of dump trucks was assigned to a Northwest model 6 shovel of 2-yd. capacity, which was working in a nearby rock quarry across U. S. 52 from the dam site, loading out blasted rock for use on

Meldahl Locks and Dam will be a modern connecting link in the busy Ohio River navigation system. It is located about 36 miles above Cincinnati, near Chilo, Ohio.

(Left) Northwest model 95 with 3-yd. Hendrix bucket works in the pit. (Right) Fine textured sand makes rough going for Euclids.

haul roads and parking areas. Blast holes were drilled with two Gardner Denver 143 Air Trac drills, punching down 4½-in. holes. Two Ingersoll-Rand Gyro-Flo 600-cfm rotary compressors furnished the air.

Working below the water line behind the cofferdam walls which shut out the river, Groves had a continuous water problem. The water was kept under control with eight Fairbanks-Morse electric powered 18-in. bowl pumps, rated at 5,000 gpm at 105-ft. head. They were installed by suction pipes in a trench-type sump excavated along the inside edge of the cofferdam with 14-in. lines discharging into the river. The nature of the material and the activity of the excavation had a tendency to fill sumps and reduce pump capacity.

While there was only normal seepage from the cofferdam, there was considerable water from the landside banks. The pump controls were located on top of cofferdams and were manually controlled so that only enough water was pumped out to leave the sand moist for best excavating conditions for draglines and scrapers.

Other pumps used by Groves included a 5,000-gpm Morris (at 85-ft. head) centrifugal; four Gorman-Rupp's, two 3-in. and two 6-in.; a Jaeger 3-in. mud pump; and ten 2-in. pneumatic sump pumps.

One look at the wet sand soil on top of the old river bank or down in the pit shows a vital need for rock-base, weather-proof parking areas and haul roads. Concrete aggregates are hauled to the site here by barges from down-river quarries and material pits.

To maintain haul roads, which had a tendency to rut from heavy loads on the wet sand base, there were two Caterpillar No. 12 motor graders and one No. 660 Adams. These machines were kept busy on a regular schedule.

The crawler fleet consisted of four Caterpillar D8's, two D9's, three D7's, a D6 and an International TD-9.

Wet sand, mixed with just a sprinkling of clay, or what might pass for fine lime, is a heavy, ornery substance that disdains to cooperate with man-made machinery. It won't slide, it won't roll, it won't support without spreading; and it offers almost negative traction to rubber-wheeled vehicles when piled. Consequently scrapers normally push-loaded, also had to be pushed with crawlers to unload.

The scraper fleet assigned by Groves to this job and sent into the pit to assist the two draglines included five Caterpillar 25-yd. heaped DW21's, with 320-hp Caterpillar diesel engines; three 18-yd. LeTourneau-Westinghouse Model C's, with 210-hp GM 6-71 diesel engines; and one 10-yd. L-W Model D, with a GM 4-71 2-cycle 130-hp diesel.

Handling the large amount of concrete for the lock walls requires proper equipment and planning. The concrete plant consists of a Johnson batch plant with a daily capacity of 5,200 yards; a 350-tph Barber-Greene aggregate conveyor system; a Fuller-

Welding rig and mechanic are stationed at downstream end of the job to handle emergency repairs. In background is a closeup view of the cofferdam cells built by Kiewit.

Meldahl Project Data

LOCKS

Number	Two
Location	Along right descending bank
Lift	30 feet
Size of main lock chamber	110 x 1,200 feet
Size of auxiliary lock chamber	110 x 600 feet
Arrangement	Adjacent, parallel, main lock riverward
Type of construction	Concrete gravity; lock walls founded on rock; guard walls on sheet pile cells and piling; guide wall on piling
Top of lock wall elevation (mean sea level)	505.0 feet
Sill elevations (msl)	
Upper and lower miter gates	440.0 feet
Emergency gate	467.0 feet
Height of service gates, both locks	65.0 feet

DAM

Type	Non-navigable, gated crest
Length (including weir)	1,734 feet
Upper pool elevation (msl)	485.0 feet
Lower pool elevation (msl)	455.0 feet
Number of gates	Twelve
Type of gates	Tainter, individual hoists
Gate size	100 feet wide x 37 feet high
Clearance of gates above maximum high water	five feet

POOL

Elevation (msl)	485.0 feet
Length	95.2 miles
Increase in height over existing pools	
Dam No. 34	24.0 feet
Dam No. 33	17.0 feet
Dam No. 32	9.5 feet
Dam No. 31	2.0 feet

Kenyon Airveyer for fly ash handling; and a Robinson activator for fly ash and cement.

Concrete is transported in special Athey concrete trailers. Each hauls three 4-yd. Gar-Bro concrete buckets with a pocket for the empty bucket left by the previous trailer. The trailers are pulled by Euclid tractors which are interchangeable with the trailers used on the 20-yd. bottom dump truck fleet. Also on the job are 18 Gar-Bro No. 4139A 4-yd. concrete buckets. Three electric-powered American R-3520, 85-ft. high gantry cranes handled the pouring.

Total concrete required is 670,830 cubic yards, divided up as follows: walls and sills, 560,000 cubic yards; laterals, culverts, outlet structures, 25,440 cubic yards; upper guard wall, 43,000 cubic yards; lower guard wall, 40,000 cubic yards; concrete on second and third pours, 920 yards; operations building, gaging stations and control station shelters, 570 yards.

For forming the concrete a steel panel yard was established near one of the main haul roads and the hundreds of tons of steel form panels shipped in from Groves supply depots, were deposited here for cleaning, repairing and oiling. Most of the forms were Blaw-Knox steel panel.

Forms Speeded

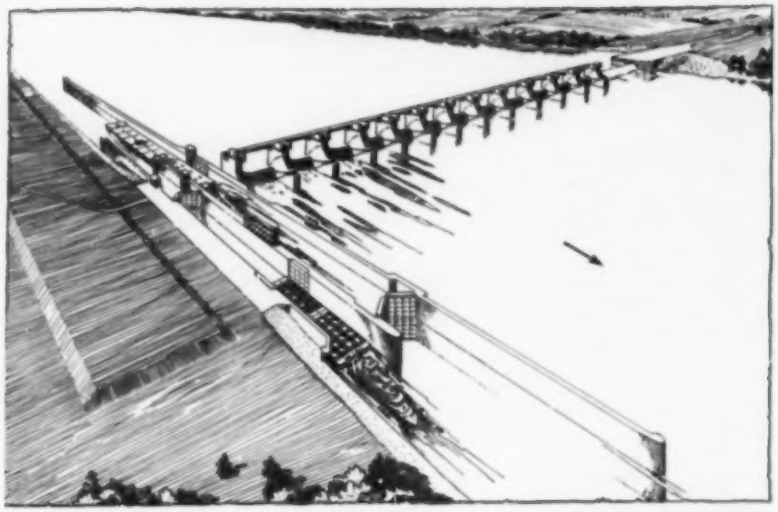
A regular production line was set up with welders, sandblasters and oilers. Forms are handled by a Bucyrus-Erie 22-B crane, which is also used with hoe front-end for excavating rock trenches. A sand-blasting outfit gets air from one of the three Joy 720-cfm electrically operated air compressors.

All panels, beams and braces were checked. Surfaces of panels were sandblasted to remove any dust or leftover concrete from previous jobs. Repairs were made when needed, and panels were then oiled and placed in stacks for use.

Some idea of the size of the lock walls can be gained from these figures: Wall base widths are 62 feet for the land wall, 67 feet for the middle wall and 61 feet for the river wall. Top widths range from 5 to 52 feet.

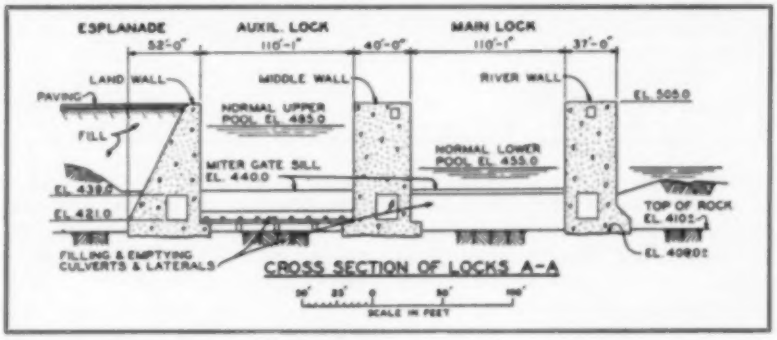
Besides walls, sills, laterals and outlet structures which contain 576,340 cubic yards of concrete, there is a tremendous amount of culvert work. There are 715 feet of 16x18-ft. culvert for the river wall; 1,300 feet for the middle wall; and 820 feet for the land wall. The smaller 3½x8-ft. and

(Left) Concrete is transported in special, shop-converted Athey trailers. (Right) Yard crane handles steel panel for concrete forms.



Artist's sketch shows how Meldahl Locks and Dam will look upon completion in mid 1964.

Both gravity flow locks fill or empty in approximately eight minutes without pumps. Wall base widths are 62 feet for land, 67 feet for middle wall and 61 feet for river wall.



Top personnel are Roy Switzer, general foreman for Dravo; A. W. Auberry, general superintendent for Groves; and R. C. Ellington, assistant project manager for Groves.

6x8-ft. gallery amounts to 2,919 feet for the same three walls.

Miter gates of welded steel are built with skin plate, girders and framing and a pre-stressed diagonal to increase rigidity. The gates are 63 feet high, 61.6 feet wide, and weigh 200 tons per leaf. There are two such gates for each of the two locks.

Each lock will have a welded steel emergency gate at the upstream end. These will have individual vertical lifts and will operate against flowing water so that lock chambers may be used as floodways. The main locks will fill or empty in approximately eight minutes by gravity flow, requiring no pumps.

The operations building, part of the Groves contract, is a two-story structure, 25 feet wide, and 85 feet long and 33 feet high. Two supplemental stations near the operations building will operate the filling and emptying systems of the main lock, while normal locking operations can be conducted from four control stations on the middle wall. Auxiliary stations will be located on land and river walls. The system is a closed hydraulic pressure type, tested to 1,500 psi and operating at about 850 to 1,000 psi.

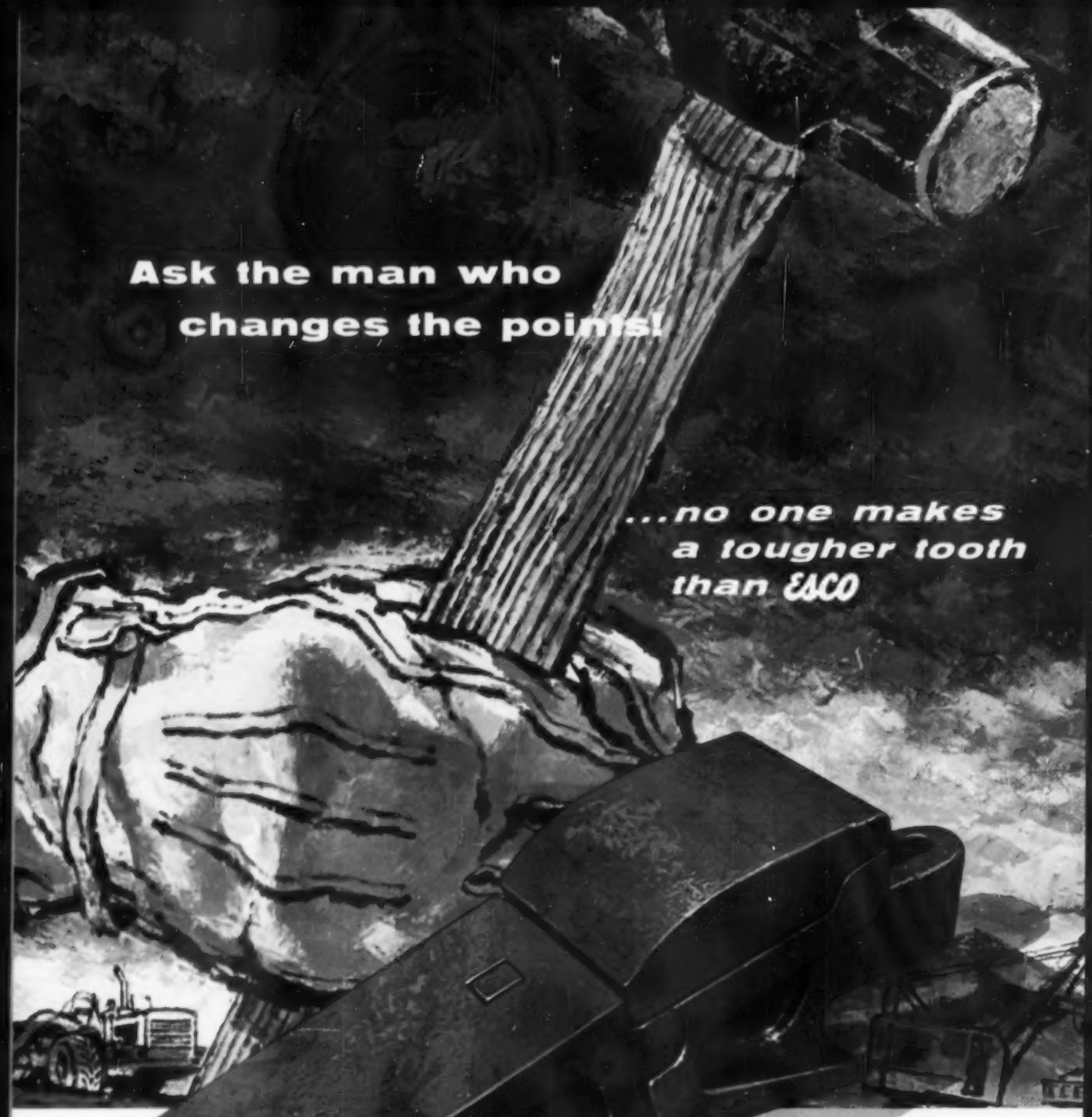
Key Personnel

The job is under the jurisdiction of the Huntington (W. Va.) district of the U. S. Army Corps of Engineers, of which Col. Steven Malevich is district engineer. Wm. D. Nowlin is resident engineer; Robert E. Ledford, assistant resident engineer; and Roy W. Dunn is chief of construction and inspection.

Representing the contractor, Groves Ventures Co., was W. J. Green, project manager; R. C. Ellington, assistant project manager; A. W. Auberry, general superintendent; C. W. Kerns, excavation superintendent; Henry Johnsen, project engineer; and Carl Stufflebeam, master mechanic.

C. W. Kerns assigned to this job as Groves' excavation superintendent, had just returned from Southeast Asia, where he spent two years instructing natives in the use of a fleet of 25 Bucyrus-Erie 22-B excavators with dragline, shovel and hoe front-ends. Kerns supervised erection of the 22-B's for the Vietnam government.

Roy Switzer, general superintendent, represents Dravo Corp., Pittsburgh, sub-contractor on upper and lower guard walls.



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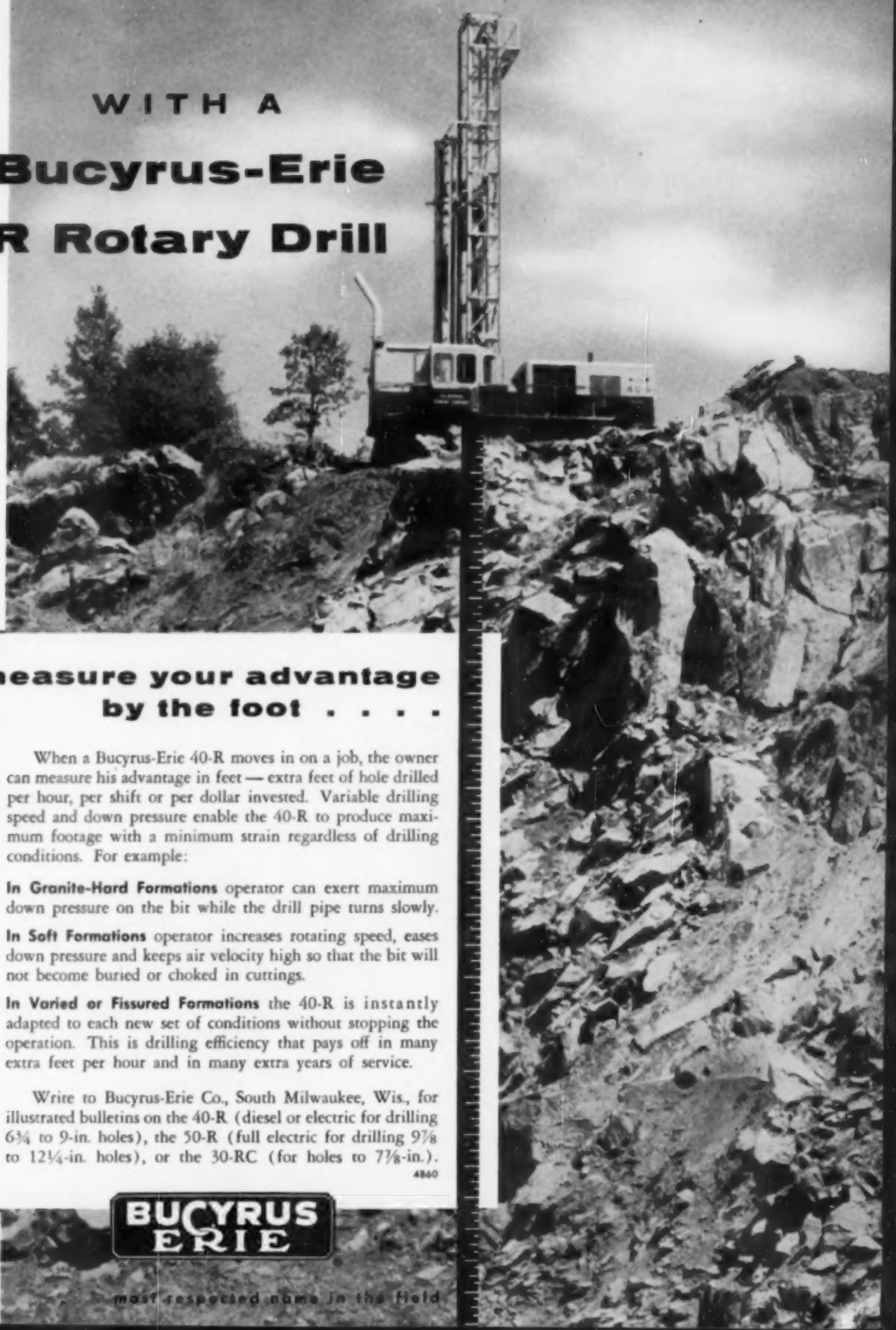

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"These DW20Gs are really hauling sons-o-guns. We've got over 600 hours (in just two months) on them and they're doing great. And this SynchroTouch is undoubtedly the coming thing—only it's here now." This is the way R. A. Heintz describes the five DW20Gs with 482B Scrapers on Heintz & Rogers' railroad relocation project around Ice Harbor Lock and Dam in Walla Walla County, Washington. The tractor-scrapers handle both belt-loading and push-loading tasks. The versatility of these tractor-scrapers has been augmented by sideboarding for easier top loading. Hauling 25 yards of bank run gravel, the DW20Gs move 240 loads every eight hours, cycling in four minutes on the ¾-mile haul.

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relocation project around Ice Harbor Lock and Dam in Walla

the ¾-mile haul.

Water by the Roll

Newest water supply conservation trick in sand dune country puts plastic diaphragm under lakes and canals.

by Ray Day

IN the permeable sand-dune country of California's Coachella and Imperial valleys, where it's been commonplace for farmers to lose a storage lake overnight because of seepage, modern science has come up with a low-cost answer to the problem. Black polyethylene, in huge rolls up to 40 feet wide and 225 feet long, is being unrolled and the edges joined with a special seaming-process tape to form vast, waterproof diaphragms under ponds, lakes and canals.

Wherever the new technique has been used, seepage stopped. And what's especially interesting to farmers, soil-conservation men and irrigation specialists, is the low unit cost. At an average price of 5 to 6 cents per square foot in place, it's as cheap as compacted clay earth lining formerly used. And it's a lot cheaper than soil cement; portland cement concrete; or any of the various forms of asphalt.

Paul Ames, head of Ames Management Service, Indio, Calif., is the man generally credited with starting the new technique in the Coachella Valley. With his partner, John Blatt, of Palco Plastics of Indio, Ames has done much to make the Coachella arm of the All-American Canal truly workable. For no irrigation system is any better than the fullest possible utilization of the waters it delivers.

Skilled Farmer

Ames, who was born and raised in the valley around Indio, started the idea practically from scratch. Skilled in agriculture himself (last year he was voted California's "Most Outstanding Young Farmer" and one of the nation's four "Outstanding Young Farmers"), his management service now takes care of approximately 15,000 acres of land for private-owner farmers. As he got into the business of farm management, with special emphasis on irrigation, Ames began to realize that all the problems of agricultural water delivery were not quite solved with the completion of the main canal system back in the last decade.

California's Coachella Valley is served mainly with water from the Colorado River, delivered by way of the All-American Canal and a most unique and advanced underground water-distribution system. Deliveries are made to individual farms on a 24-hour basis. Many of the successful citrus, grape and early vegetable lands are on the rim of the valley, where night irrigation is impractical due to the light soils and the necessity to run fast water under close control. It was Ames Management Service which began to solve the problem originally by constructing reservoirs to hold the water at night, so that it could be used in the daytime.

Since then, the use of reservoirs has become standard throughout the valley, and they have been important in the conservation of water through

Workmen unroll big 200-ft. long sheets of black polyethylene across a reservoir site, welding together the longitudinal edge joints with liquid mastic and a special tape.

Method of protecting joints by burying them in a trench is shown here. After the Ferguson-mounted blade shoves dirt over seam, the outer edge will then be rolled back.

efficient and better controlled irrigation practices. However, because of the light-textured soils, sand dunes and other areas that many of these reservoirs were built on, seepage has always been the No. 1 problem. It might also be said that until the plastic lining method was developed, there was no practical low-cost way to control the situation. Soil cement was tried in a few cases, but its cost was far out of the reach of the average farmer. Clay lining didn't work either. Why? The Colorado River has a high calcium content, so in a short time clay lining becomes flocculated and permeable.

Like any specialist, Ames and his crews have developed the type of expertness over the years which makes the work go in fast and efficiently, and avoids many common mistakes. One of the early problems, for example, was how to handle big rolls of polyethylene in light winds. That particular problem was solved by keeping the material under tight control as it was unrolled, using sand bags to weigh the material down if necessary, and putting the "miracle seal" tape along the joints. Immediately afterward, the jointed edge was covered with dirt backfill.

One of the most interesting jobs the firm has done to date was a 2½-acre, 14-ft. deep lake which was seepage-proofed at Bermuda Dunes Country Club, in the sand dunes near Indio. In an effort to give Ames' crews a damp, sound surface on which to work, owner's representatives kept the pumps running until midnight.

By 4 a.m. when the crews began work, seepage had completely drained away 5 feet of water which the pumps had supplied. The job was finished in less than a week, despite bad winds, and it stopped all seepage.

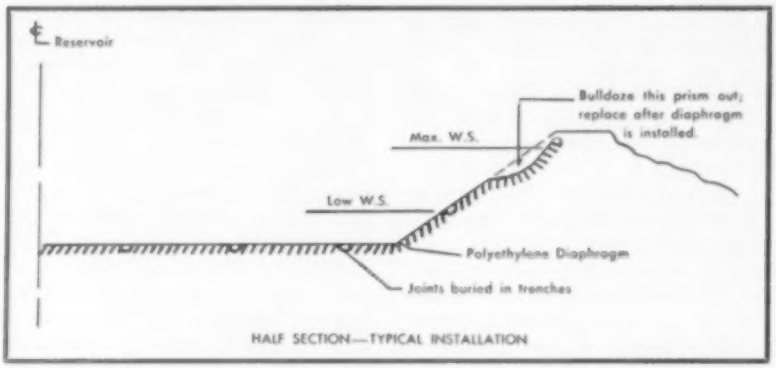
In the three-year period since the first material was placed, the Palco Plastics organization has developed a skilled 6-man crew which is so thorough and fast that labor is not a discouraging expense.

The method which Palco has worked out consists primarily of putting the water-tight diaphragm on existing reservoirs or storage lakes. In other words, no organization, as such, exists for construction of these ponds. Ordinarily, they've previously been built by the farmers, either with their own equipment or under separate contract. Palco simply takes

Hold 'er down, boys! Winds which billow the plastic material are one of the biggest problems in western desert country. Sand bags weigh down the sheet.

Owner Paul Ames and his partner, John Blatt, look over a newly laid lining.

Use of the material is extending to irrigation canals, like this one in Wyoming, where a 15-B hoe cleans a ditch to restore it to full efficiency. It's conceivable that most seepage losses can be stopped by applying liners of the new plastic material.



HALF SECTION—TYPICAL INSTALLATION

over to make these storage reservoirs watertight.

At the present time the crew is using a Caterpillar D6 tractor with an angle dozer for doing the important excavation phase. This consists of scooping out approximately 6 to 8 inches of material from a point near the top of the impoundment dike down approximately 12 feet.

On this operation, the tractor is worked uphill so that loose material scooped out can be piled on top of the impoundment dike until after the polyethylene film has been laid.

Purpose of this earthmoving is shown in the diagram that appears above. By scooping out some of the dirt and then laying polyethylene below the earth line and backfilling it again, the film is protected around the top portion of the reservoir. The dirt covering improves the pond's appearance and permits turf to be grown to the water's edge.

At the same time this excavation is being done, the drained lake bottom is scooped clear of weeds and other debris, so that the polyethylene blanket has a firm, sound bedding.

The material which is being used was originally introduced by Gering Plastics of Kenilworth, N. J. This firm supplies the materials to Palco Plastics which makes the installations on a commercial basis. The rolls of 6-mil thick plastic are unrolled carefully, held down if necessary, and edges bound with a special liquid mastic and the tape developed expressly for this service.

The seam is buried immediately after it's made by using a rubber-tired Ferguson tractor-loader to dig a small ditch, then embedding the joint in the ditch bottom, and covering it again with dirt, using the same machine. The edges are carried up the sides of the impoundment embankment to a point above the highest water surface. At that point, the edge is turned under with similar ditching, and the D6 dozer shoves the originally excavated dirt back down over the material. It finishes off the top of the earth embankment the same as it was before, and leaves the polyethylene exposed from that point down the sides and on the reservoir bottom.

Tests have shown conclusively that so long as the material is under water, it suffers no ill effects—presumably on an indefinite basis. Even where the material has been exposed to harsh sunlight and wind above the water line for 7 years, there has been

no visible deterioration of the product. According to John Blatt, of Palco Plastics, the material is bare and exposed above the fluctuating water surface of the average reservoir. Below that point, sediment settles over the material. After about a year a film of silt has settled out to cover the polyethylene.

Size, shape and soil types govern costs. Irregular shapes, which call for cutting and waste of the polyethylene, tend to increase costs slightly. If 8-mil material is used, as it must be in rocky or gravelly ground, costs also go up commensurately.

What Ames Management Service and Palco Products have accomplished in California is also of interest to many roadbuilding contractors, too. Firms which face water storage problems in connection with roadbed embankment compaction have already begun to adopt the new principle. And it's working beautifully. Handled carefully by skilled men, the new plastic is catching hold so rapidly that Ames and Blatt have now set up several crews to install the material on a commercial basis all over the West. By having trained and skilled crews to do the job, it can be done for farmers and lake owners at a lower price than they could do the job themselves with inexperienced help.

Cheesecake here helps tell the story of Indio's Bermuda Dunes Golf Club, where a pond lining job conserves irrigation water for the club greens and fairways.

BIG

in QUALITY and ECONOMY

OWEN

OWEN clamshells are constructed with increased power and more durability foremost in mind. One of these features is the recessing of the top of each lip to receive the bowl plates. This gives the bucket a smooth interior and also relieves all stress and shear on the rivets that join the lips to the bowl plates. **Recessed lips are standard on all OWEN buckets —and at no additional cost!**

This is just one of the many reasons why OWEN Buckets are guaranteed pound for pound—size for size—to get a bigger load each bite—a larger output each day.

Write us your exact requirements. Remember, OWEN Engineers are at your service. Send for Free Catalog today.

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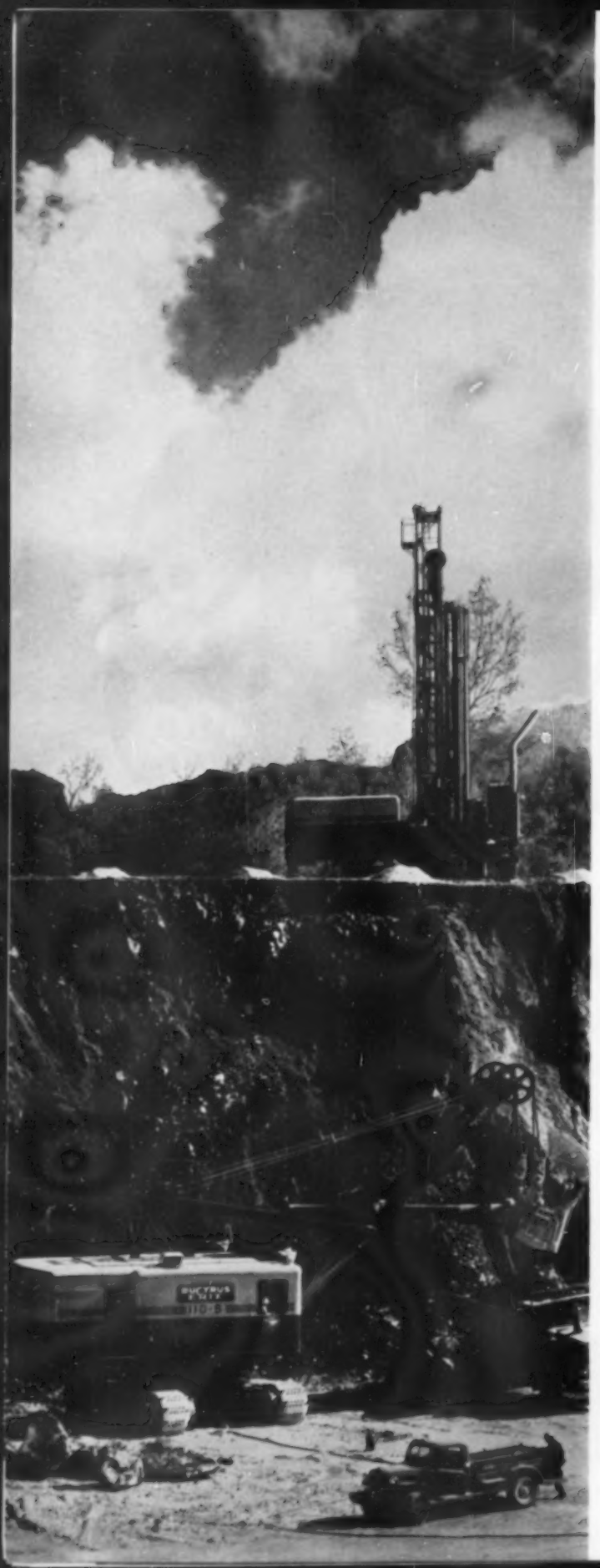


A message from

ROBERT G. ALLEN,
President,
Bucyrus-Erie Company

the president of Bucyrus-Erie:

"Here's why you buy a whole system of profitable operation when you buy a Bucyrus-Erie!"

"**Bucyrus-Erie** builds 182 completely different models in the ⅜ to 20-cu-yd class.

Bucyrus-Erie builds cranes and excavators utilizing manual, hydraulic, air and electric controls . . . gas, diesel or electric-powered.

Bucyrus-Erie builds a complete line of draglines from ⅜ to 45 cu yd, many of which can be offered with crawlers or as walkers.

Bucyrus-Erie builds a complete line of stripping shovels from 2½ to 150 cu yd.

Bucyrus-Erie builds a full line of special machines **in addition** to the standard models, including wheel excavators, tower cranes and railroad wrecking cranes.

Bucyrus-Erie builds 25 different blast hole, water, and oil well drills of every type—churn, rotary, down-the-hole, jet-piercing and diamond bit.

Isn't it logical that this is the kind of depth-experience that can best provide you with assistance in building better profits from your operation?"

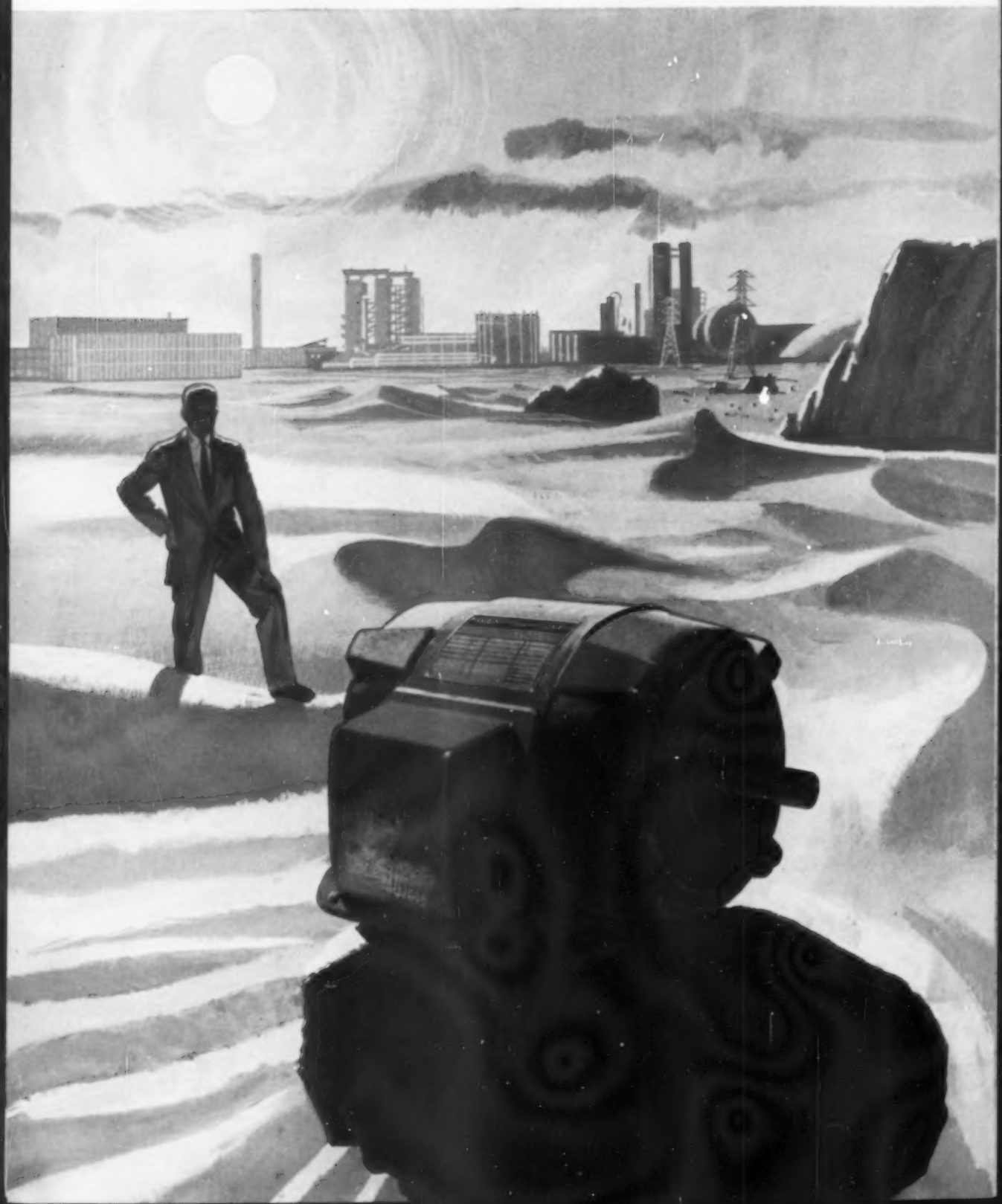
9L60

Robert G. Allen

BUCYRUS-ERIE

New Guardistor

THE MAN & THE MOTORS



FROM WESTINGHOUSE

Guardistor motors let you match the full capability of the motor to the job— with complete safety—absolute confidence

Our Marketing Manager says:

- "You can match the motor to the load . . . use all the motor you are paying for.
- Provides positive protection based on winding temperature . . . *not* load current and/or power supply fluctuations.
- Eliminates time and expense of changing winter-summer heaters. No nuisance tripping, it's fail-safe . . ."

Our Engineering Manager says:

"With the breakthrough development of the Westinghouse Positive Temperature Coefficient thermistors, for the first time we can provide inherent protection against motor failure caused by excessive heat. The solid-state thermistors buried in the windings instantly sense excessive heat from any cause and simultaneously warn of trouble or automatically take the motor off the line. Thus, motor protection is placed where only true motor protection can be . . . in the windings."

Call your Mr. Westinghouse for the application of a Guardistor* motor to your drive requirements . . . write for *Questions and Answers About . . . Guardistor* (B-7876). Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

*Trade-Mark

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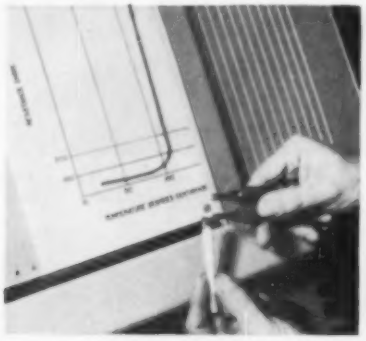
Unlike remotely located sensing devices, PTC thermistors are buried in the windings of the Guardistor motor, instantly equating all temperature factors.



Ever alert PTC thermistors constantly totalize temperature, statically triggering an action *only* if critical temperature is reached.

MOTOR & GEARING DEPARTMENT

YOU CAN BE SURE...IF IT'S

Westinghouse

Road Contractor Drains Swampland for Borrow Fill

There's a saying among earthmovers that Florida is 650 miles long, 150 miles wide and one foot high.

Couch 18-in. turbine pump powered by a Cat D318 engine drains the borrow area where a scraper is being pushloaded. Pit yields high bearing gray sand and low bearing yellow sand. The latter had to be mixed with higher bearing material at the fill.

OBTAINING borrow material in Florida is a real problem. Hills come at a premium in tabletop central and south Florida, and available dry land is used for agricultural, commercial or residential purposes. What's left is usually swampland.

This was the problem facing White Construction Co., Inc., whose home base is Chiefland, Fla., when it undertook two separate highway contracts totaling 7.10 miles and involving almost three million yards of earthmoving at a total bid price of $3,828,725.

The projects are taking place on the East-West interstate freeway linking Tampa with U.S. 1 at Daytona.

Nearing Finish

The jobs are separated by a bridge under construction which spans St. John's River near Sanford. The larger of the contracts, consisting of 4.85 miles, is in Volusia County on the north side of the river and is about 70% completed; the smaller project of 2.25 miles, which is about 50% completed, is on the south side in Seminole County. In charge of both projects is Superintendent I. E. Mincey.

Mincey's nearest available source of borrow lay buried under a foot or more of swamp water. To reach it, sturdy 5-ft. high dikes were thrown up by four draglines, including a Bucyrus-Erie 38-B with 2½-yd. bucket; a 30-B and 22-B with 1¼ and 1-yd. buckets respectively; and a 1¼-yd. Koehring 304. The water was siphoned out by 18-in. diameter Couch turbine pumps powered by Cat D318 engines. This technique had to be used on a total of five borrow

It was swampland like this White had to use for borrow material after first clearing cabbage palms and oak trees, and building dikes and draining the area.

pits for the two jobs, ranging in size from 19 to 57 acres. As the borrow pits are worked out, a section of the dike is knocked down and the area permitted to return to its former swampy state.

Remove Muck

As on many road jobs in Florida, muck was encountered. The worst was at Pageant Creek, where a 38-B with 2½-yd. dragline bucket scooped out 137,000 yards of muck to a depth of 20 feet before a stable base could be reached. Adding to the difficulties of the job were unusually heavy rains, particularly in early spring, when the area received 65% of its annual rainfall in a three-week period. The projects were shut down for five weeks, but gradually returned to schedule.

To handle earthmoving on the two projects, Mincey split his fleet of 10 Caterpillar DW21-470 tractor-scrapers into two teams of five each, one team pushloaded by a Cat D9 tractor, the other by tandem D8's.

An unusual sidelight occurred when the earthmoving phase of the Volusia County project was getting underway. In order for the DW21's to reach the borrow pit, they had to "wade" approximately a mile and a quarter across a plain which was two feet or more underwater. "It was a pretty strange looking armada," Mincey recalled, "but we made it in good shape."

Although the borrow pits are drained of water, loading conditions are difficult. This is evident by the fact that the sandy, spongy material undulates not unlike a crawling snake under pressure of the tractors and scrapers. Nevertheless, the scrapers are obtaining heaped, 18-pay-yard loads. With well-maintained haul roads, the loaded units are traveling in 5th gear; dumping in 2nd and 3rd. The borrow material itself consists of high bearing gray sand and shell and low bearing yellow sand. The latter

Four draglines, like this 30-B with 1¼-yd. bucket, throw up dikes five feet high so water can be pumped out. Five borrow pits on the job range in size from 19 to 57 acres. After they are worked out, the dikes are opened and water is permitted to return.

A D9 tractor pushloads a DW21. Loading was difficult because the sandy, spongy material undulated under pressure of the machines.

While one DW21 returns to the borrow area and another approaches with an average of 18 pay yards of fill, a Cat No. 12 motor grader blades the material. Special airplane-type tires are used on the grader for greater flotation in sandy soil.

is mixed with the higher bearing sand at the fill with a Seaman Pulvermixer pulled by an International TD-14.

Working the fills on each project are a Cat D7 tractor with angle dozer which spreads the material and a Cat No. 12 motor grader which handles fine blading and sloping. A second No. 12 maintains the haul road.

Both interstate projects require 75-lb. bearing, 12-in. stabilized base; a 10½-in. limerock base; and 3½-in. asphalt surface. The Seminole contract requires a total of 158,206 yards of base material and 133,880 yards of asphalt; Volusia's requirements are 221,501 yards of base and 241,000 yards of asphalt. The two 24-ft. lanes, split by an average median of 24 feet, will have paved 10-ft. shoulders on the outside lanes, 8 feet on the inside. Side slopes range from 2 on 1 to 12 on 1. Two grade separations are called for in the Seminole project, and three in Volusia County.

Bridge Contractor

The St. John's River bridge which separates the two jobs is being built by Industrial Construction Co. of Ft. Pierce, Fla. Nearing completion, the structure with precast concrete pilings is 2,664 feet long and 60 feet wide.

Assisting Superintendent Mincey are Rubin Jerrels, Jr., grade foreman at Volusia, and C. L. Durance, grade foreman at Seminole. Jasper Roberts is resident engineer.

Compacting limestone base laid on top the stabilized subgrade is a three-gang traffic roller pulled by a Ford farm tractor. A 100% compaction density is required here.

SPECIAL REPORT TO CATERPILLAR OWNERS:

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Parts you can trust
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Know All Men by these Presents,

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in the sum of not exceeding the lesser of FIVE THOUSAND DOLLARS ($5,000.00) or Seller's price, with respect to each parts assembly described below, for the payment of which Seller hereby binds itself, its successors and assigns by these presents.

The Condition of this Obligation is such that Whereas Seller has sold to Buyer the below-described parts assembly or assemblies originally manufactured by Caterpillar Tractor Co. and reconditioned in accordance with practices recommended by Caterpillar Tractor Co.:

DESCRIPTION	PART NUMBER	SERIAL NUMBER	SALE PRICE

And Whereas Seller guarantees each said parts assembly against unsatisfactory performance due to defective material or workmanship for _____ days after the date of sale shown below (herein referred to as the guarantee period), the obligation under this guarantee being only to repair or replace, as Seller may elect, any said assembly which proves defective in material or workmanship under conditions of normal use during the guarantee period at Seller's expense (including cost of all necessary materials and labor) up to a maximum of the lesser of Five Thousand Dollars ($5,000.00) or Seller's price, with respect to each said assembly, except that the cost, if any, of transporting each said assembly from and to Seller's place of business shall be paid by the Buyer.

Now, Therefore, if Seller, its successors and assigns shall in all respects well and truly perform the obligations under the guarantee recited above, then this obligation shall be void, otherwise to remain in full force and effect.

THE ABOVE GUARANTEE IS VOID, AND SELLER SHALL BE UNDER NO OBLIGATION THEREUNDER, IF CLAIM IS NOT MADE TO THE SELLER WITHIN THREE (3) DAYS AFTER DISCOVERY OF THE DEFECT UPON WHICH THE CLAIM IS BASED.

You can have complete confidence in any Parts Assembly Exchange or Rebuilt Unit carrying the dealer's new Bonded Buy label. You'll receive a Guarantee Bond, backed by the Lumbermens Mutual Casualty Company of Chicago, Illinois, giving the guarantee conditions agreed upon at time of sale. This is further evidence that a Caterpillar Parts Exchange or Rebuilt Assembly is in first-class condition—another way of expressing the careful and thorough workmanship that goes into each of these reconditioned assemblies.

The cost? It compares favorably with the cost of doing the reconditioning work yourself. Often less . . . because of the availability of special equipment and servicemen's skills in the dealer's shop. Your final net cost is based on parts and labor necessary to put your worn assembly in A-1 condition—same as the exchange unit you receive.

Here's why Cat Reconditioned Assemblies save you money. You trade down time for more *go* time. Simply:

1. **Call your Caterpillar Dealer and arrange for the Parts Assembly you need.**
2. **Remove your worn assembly and install the reconditioned unit.**
3. **Put your machine back to work immediately and return the worn unit to your dealer.**

Any way you look at it, a Bonded Buy Parts Assembly is a good deal. You get a dependable unit . . . guaranteed in writing. The cost is approximately the same had you done the work yourself. Time saved can be converted to cash because your machine's working and earning. Contact your Caterpillar Dealer today. Find out what assemblies he stocks (new items are being added daily).

SERVICE TIP: Never allow your present machine components to become worn to the point where reconditioning is impossible.

CATERPILLAR

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Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

NOT in the Contract

Two golfers, strangers to each other, happened to meet on the golf links.

"See that girl over there?" said one. "Imagine her parents allowing her to appear in clothes like that. Just copying men's clothes."

"That sir, is my daughter," said the second golfer.

"Oh pardon, me, I'm sorry. I didn't know you were her father."

"I'm not. I'm her mother."

Little, demure Helen Hunt found a wallet containing $20. Being as honest as she was pretty, she reported her find to the local newspaper. They ran an ad reading:

"The party who lost a wallet containing $20 can go to Helen Hunt for it."

New father: "I'm so excited! Is it a boy or a girl?"

Nurse: "The one in the middle is a boy."

The dowager accosted the photographer.

"What a horrible job you did on my photograph," she exclaimed. "I remember when you really had skill. Why the last pictures you made of me were exquisite, beautiful . . ."

"Yes, madam," the photographer replied, "but you have to consider that I was 15 years younger then."

Having only recently moved into the district, she was determined to impress the neighbors. She arranged for a musical at home and told her husband to arrange the booking of a musician to entertain the guests.

"Have you engaged the pianist yet?" she asked a few days before the great evening.

"Yes, my dear," he replied, "a great virtuoso."

She looked annoyed.

"Never mind about his morals. Can he play?"

Kangaroo complaining to psychiatrist, "I don't know what's the matter with me. I just don't feel jumpy anymore."

A boy and a girl were out driving. They came to a quiet spot in the country lane and the car stopped.

"Out of gas," said the boy.

The girl carefully opened her purse and pulled out a bottle.

"Wow," exclaimed the boy. "You've got a whole pint—what kind is it?"

"Gasoline," replied the girl.

On a visit to the continent 'down under,' a Texan was being shown around one of Australia's vast ranches. Unimpressed, he told his host, "Why, this would be just a tiny chunk off of my spread back home."

When he arrived at where a huge herd of cattle were grazing, he commented, "Nice, but they'd get lost among my herd."

A kangaroo suddenly came up behind him and leaped by. The startled Texan exclaimed, "What in heck was that?"

His Australian friend calmly answered, "You mean you don't have grasshoppers in Texas?"

Sailor and a girl were riding on horseback out in the country. As they stopped for a rest, the horses rubbed necks affectionately. "Ah, me," said the sailor, "that's what I'd like to do."

"Go ahead," said the girl. "It's your horse."

"Okay, okay! So now I know how your road grader works!"

The doctor was visiting Rastus' wife to deliver her twelfth offspring. Riding along with Rastus, he saw a duck on the road. The doctor asked:

"Whose duck is that?"

"At ain't no duck, Doctuh," said Rastus. "At's a stork wid his legs wore off."

Did you hear about the fellow who hit it good at Las Vegas? He went down there in an $8,000 Cadillac, and came back in a $45,000 Greyhound.

Two construction men in town after a long stretch at a remote job staggered from the bar, stumbled into their car and drove off, ending up in a maze of glass in a department store window. One of the female dummies had been knocked to the sidewalk, and lay there life-like.

Said one catskinner to the other: "Wouldn't you know it—a woman driver!"

This 21000-powered Bucyrus-Erie 54-B and personnel on the barge with it must work in isolated areas for long periods at a time.

"Our new 21000 engine is saving 30% and more on fuel!"

— says spokesman for Sam Carline, Inc.

"We are pleasantly surprised to see how well the 21000 does the job of the larger engine we took out of a 54-B," said Wallace Carline, general manager of Sam Carline, Inc., Berwick, Louisiana. "Then when we found our fuel saving was so great, we were even more sold on it. We have now ordered a second one for another of our Bucyrus 54-B's."

The dragline is mounted on a barge, along with living quarters for the personnel, and operates in back swamps and bayous of Louisiana. Since it must work for long periods in the remotest parts of this country, dependability and a minimum of maintenance are essential. The 21000 has fulfilled every expectation—requiring no attention other than routine maintenance.

If you want performance, fuel economy and dependability like this, let your dealer tell you more about the amazing 21000 and the companion 16000 diesels. Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS
***POWER* FOR A GROWING WORLD**

BC-31

How Payscraper®

"automotive" operating ease highballs your dirt-on-fill delivery

You won't need stunt-car "jockeys" or muscle men to give you the dirt-on-fill bonus the 375-hp International Payscraper rigs can deliver! Almost all the danger, hard work, and rump-bumping of rubber-tired rig operation is engineered out of Payscraper models. And an exclusive combination of operating ease, safety, and comfort features is engineered in!

Push-button, finger-tip ease! Your operator simply pushes a button to direct-start the DT-817 Diesel and ready 375 high-torque hp to give a cycle-speeding Payscraper rim-pull of 60,000 lbs.; plus time-saving, "no-lag" control power!

Your operator pulls directly out of 90° turns—with 34-cu. yd. heap loads on either the 2-axle "295" or 3-axle "495." Ample power and traction team with the exclusive International tandem-pump, rack-and-pinion steering to give positive, right-angle turning with full power. This finger-tip controlled system leaves the "steering feel in the steering wheel," even at the top 33.5 mph speed.

For fast, positive dumping, the high Payscraper apron lift gives you a "barn-door-like" opening up to 94 inches! The positive-acting Payscraper ejector mechanism is powered by the International shock-absorbing, planet-type Cable Control Unit. One cable drum of this simple, fast acting unit actuates apron and ejector; the other drum positions the bowl to control spreading action. Shown, the 3-axle "495" fast-dumping on the fill!

He power-shifts the Payscraper, up or down almost like easing his car into automatic drive. The 4-speed, planetary-type, torque-converter transmission gives him load-speeding *automatic* direct-drive lock-ups in second, third and fourth gears!

Your operator power-steers the 150,000-lb. loaded Payscraper with automotive-like ease. He commands the exclusive "mind-reading" International rack-and-pinion, tandem-pump steering system—plus 3-degree forward spindle pitch that improves scraper balance and prevents "bucking bronco" nose-downs in high-speed turns!

He controls 34 cu. yd. loads on hills, fills, turns—anywhere—with positive-acting Payscraper air brakes. He power-controls all Payscraper dirt-handling actions, finger-tip easy, with the International PTO-driven constant running cable control unit!

And he rides in a foam-cushioned, 15-adjustment, bucket seat that gives positive, selective ride-control to match luxury car comfort.

See for yourself what it means, in highballing your dirt-on-fill delivery, to arm your operators with Payscraper advantages. Prove what happens when you give them the highest power-to-payload punch of the 34-cu. yd. rigs—along with Payscraper operating ease and safety. Choose the 2-axle "295," or 3-axle "495" and let your International Construction Equipment Distributor demonstrate!

Up or down power-shifting—effortless power-steering—fast power control of Payscraper dirt-handling—all help your operator give you fast "kick-outs" and get full pusher hp efficiency. The highest power-to-payload punch of all 34-cu. yd. scrapers helps highball dirt delivery. The planet-powered TD-25 and TD-24 are "pushing" for this fleet of "295's"—building superhighway!

Here's the big torque converter transmission—that helps Payscraper models turn 375 turbocharged hp into industry topping production! Besides providing smooth shifting and speeds for every need, this torque converter gives automatic lockup for direct, load-speeding mechanical drive in 2nd, 3rd, and 4th gears!

International® Construction Equipment

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE

Mexico's Biggest Hydro-Electric Project

Country's biggest contractor, ICA, to complete first power unit at Apulco by next year.

by Mary Saint Albans

MEXICO, with its expanding population and rapid industrialization, needs more electric power every year. The demand increases at the rate of 12 or 13% annually, faster than in any other Latin American country. To cope with this demand the Federal Electricity Commission (CFE), along with private companies, boosted the nation's output to more than 2.5 million kilowatts in 1958, and hopes to double this mark within the next half-decade.

The most formidable hydroelectric system in Mexico's ambitious program is Mazatepec, commonly called Apulco, which will harness the waters of the Apulco and Xiucayucan rivers in the eastern edge of the state of Puebla. At a cost of approximately $96 million, the new Apulco system will put 104,000 kw on the lines by 1961. Another 104,000 kw, the remainder of the first power unit, will be produced by 1964. A second powerhouse to produce 156,000 will be completed by 1966. Still on the drawing boards are third and fourth units.

Tackling the Apulco job is Associated Civil Engineers (ICA), the biggest contracting firm in the republic. From its inception as a loose organization of about fifty undergraduate engineers in the University of Mexico's engineering school some fifteen years ago, Associated Civil Engineers has broadened and matured. Recent ICA accomplishments include oil refineries, industrial plants, an entire city for 250,000 people built from scratch, dams, irrigation canals, factories and highways.

Road construction on the Apulco project entails more than 7.8 million cubic yards of excavation and 57 million pesos of expense. This portion alone might be regarded as a worthwhile job by many big contractors. The roads include 13 miles of 23-ft. wide gravel road to the dam, 10.5 miles from there to the site of the first powerhouse, and 31 miles of 16-ft. wide access roads.

La Soledad, or "The Lonely Place," is the site of Mexico's Apulco dam now being built.

Deep Gorge

To see the mighty Apulco project, take the highway toward the Gulf Coast town of Nautla. About 135 miles east of Mexico City, at the drowsy Indian village of Tlatlauquitepec turn right and weave down the cliffside road to the deep gorge damsite called *La Soledad*, meaning "lonely place."

When this reporter first visited the scene in 1955, we skittered perilously along an ox-cart trail which had been in use for over a century. Occasionally nearby or on distant slopes one could glimpse bright yellow Cat tractors pushing rock and dirt up or down to make cuts and fills.

In order to achieve faster going to the tropical valley below, and to facilitate the arrival of the giant turbines, subcontractor Ing. Rodriguez Beltran and *Constructiones y Urbanizadores del Pais* (CUPSA), were making 13 miles of 20-ft. gravel road to the dam.

As in all projects where land is more vertical than horizontal and where rains are copious twelve months of the year, roads are a problem. Happily, however, the terrain is about 40% andesite and dolomite mixed with 60% clay, and not too difficult

Three large ICA shovels excavate for the foundation of one of two dikes which will flank the curtain dam across the Apulco river.

to handle. But rains complicate the situation. Recently a torrential downpour brought a million cubic yards of rock crashing down the mountain to bury the Mazatepec road.

Rigorous attention is paid to maintaining culverts and ditches and repairing washouts.

Rains also manage to slow up construction work even though the ICA engineers think they have in part licked the problem. The company issued each workman an all-enveloping outfit consisting of boots, trousers, jacket and hat. But, cursing such garb as "miniature Turkish baths," engineers and foreman usually choose to work in their cool cotton garments even though a sudden cloudburst may leave them soaking wet all day long.

Bustling Village

On entering the narrow Apulco Valley on the new wider highway, in our latest visit to the project, we passed a rambling CFE camp shaded by flowered tropical trees, and then drove through the burgeoning village of Atotocyan. Another mile brings into view ICA's general field office, built of rough lumber. A hundred yards below on twisting muddy roads are warehouse, machine and shops, repair yards, and then the sawmill, perched on a cliff overlooking the Apulco River canyon. White markings indicating the dam curtain elevations can be seen on the opposite side of the gorge.

In the main offices and in the box-like quarters of the various branches of the project, work 25 ICA engi-

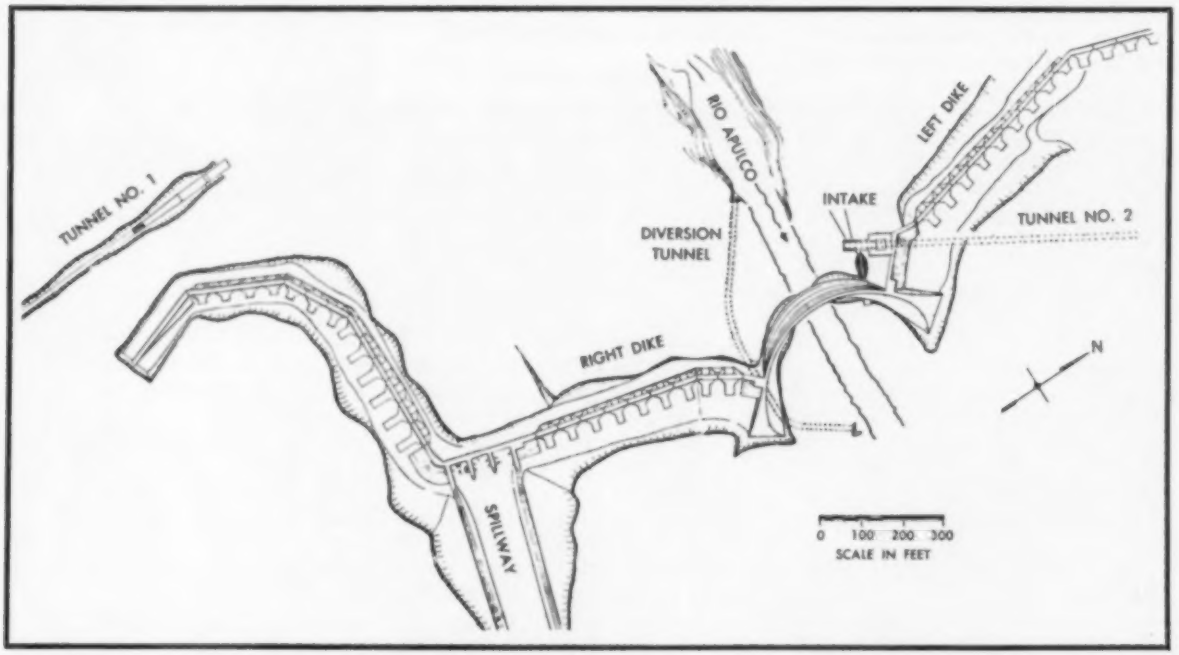


Diagram illustrates extensive system of dikes and tunnels which control water supply of the $96 million federal power project.

neers. Twenty government engineers toil at the CFE camp.

Both ICA and CFE have several more executives furthering this enterprise from offices in Mexico City. At the government's imposing Federal Electricity Commission building in the capital, Ing. Gonzalez Martinez, head of Construction of Civil Works, has the final word on designs and plans. His Apulco representative is Ing. Rogerio Canales.

At Mexico City ICA headquarters, Ing. Luis Calvillo represents Ing. Francisco Norena, one of four general managers of ICA. (Three others are Engineers Alberto Barrocio, Saturnio Suarez and Senor Ricardo Penafiel.) Noreno is assigned to Apulco, the firm's largest project at present. Ing. Fernando Espinosa is consulting engineer. Ing. Francisco Senteis, head of machinery for all company enterprises, devotes a great deal of time to Apulco's varied and often pressing needs in that line.

At the job site, Ing. Fernando Favela is resident engineer; Ing. Fernando Arrioja is manager of machinery; Ing. Rodolfo Gaona is maintenance chief; and Ing. Sergio Barrera is also responsible for equipment.

Ing. Victor Hardy, the tunnel expert, might be found down at the entrance of tunnel No. 2 which opens on a hacked-out ledge along the cliff about 98 feet below the top of the gorge. He is the son of the famous Victor Hardy who, during the Diaz regime, built many tunnels on the country's vast railroad system.

From the gorge will rise the graceful arch dam curtain, 360 feet high, 328 feet wide. Concrete, about 130,000 cubic yards, will be conveyed on a Lidgerwood cable tail tower in five Blaw Knox buckets. Six Joy drills now employed in obtaining samples of deep soil, and four Gardner-Denvers will be assigned to grouting.

Stockpile Materials

A Dillon concrete plant and two Wagnermobile mixers are being assembled on the cliff next to the sawmill. Three conveyors will carry sand and two sizes of aggregates. Forty thousand cubic yards of gravel are in stockpiles with perimeters well ditched for drainage. Sand is stored in silos.

A Worthington double drum 35S mixer worked in Tunnel No. 2 receiving sand, gravel, and cement from a Brookville train. Concrete poured into a pneumatic placer to reach the forms via two 17-ft. long Goodrich rubber belts.

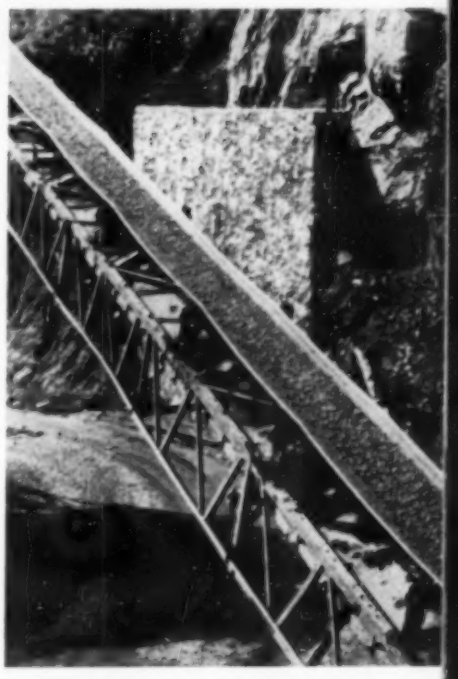
This pressure tunnel, 21,550 feet long, will have its intake on the left dike. Heavy infiltrations of water, about 190 gpm, were encountered along its length necessitating the installation of two pumping stations with substations and trenches. Valve house and oscillating well will be near its lower exit.

At the tunnel's lower exit, an Eimco 40-H dug rock and dirt to dump into five CS Card cars hauled back and forth by a Plymouth locomotive. Overhead ran two ventilating pipes, and at one side a line of 6-in. Naylor tubing carried air power to a G-D jumbo equipped with four CF-93 drifters.

About 190 tons of metal shoring will be used inside along with 1,787 cubic yards of calking and 7,800 cubic yards of concrete.

Below began Tunnel 3, 10,440 feet in length. It will be reinforced

(Left) Extensive drilling is required in construction of access road. (Below) Belt conveyor transports material from crusher.



with 386 tons of steel. Inside, a G-D jumbo and four Atlas Copco drills were at work. Power arrived from two portable GD-900 compressors outside. A Plymouth hauled and dumped debris.

Along the hillside emerged a smaller tunnel from which a stream of water flowed across to the Apulco River. An underground stream had been encountered some 490 feet within Tunnel 3, and this diversion outlet had to be bored.

Nearby was the power station building that will house four Pelton-type turbines each delivering 52,000

kw and 74,000 hp. The first two turbines, to be installed in 1961, will supply power to Puebla and Veracruz.

Below, a small aggregate plant was fed with gravel by a new LD7 Scoopmobile, and a Mixermobile poured concrete via gravity into wall forms. Two other Scoopmobiles were busy at aggregate piles.

Tunnel No. 1 enters the dam base at the far end of the right dike. This tunnel is over two miles long, and has its intake at Atexcaco, site of the powerhouse that will be built after the Mazatepec turbines are installed. Tunnel No. 1 will take water not only from the Xiucayucan river with its annual flow 270 million cubic meters, but also from the adjoining Cuateno basin, two cubic meters a second, and from springs at the right bank of the river, 2.5 cubic meters a second.

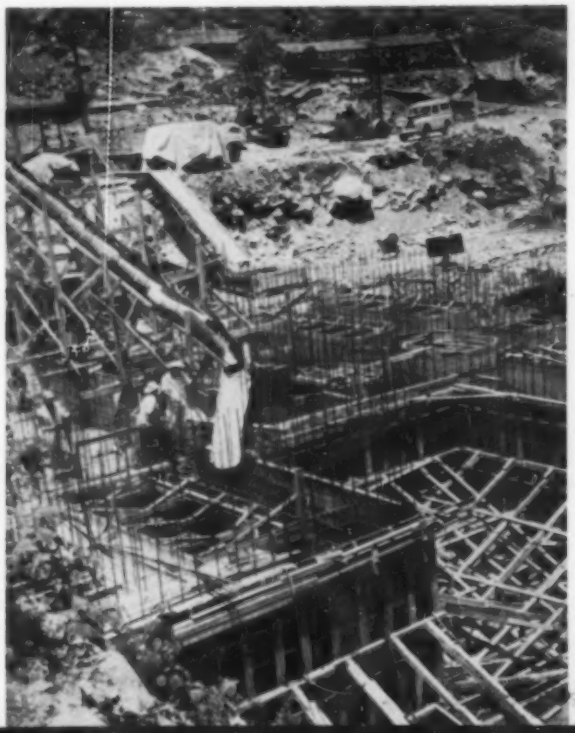
Extensive sand cave-ins had stopped all work on this tunnel for some time, but now an Eimco 40-H along with a jumbo and drills were again making good progress.

Dikes fanning out from the right and left sides of the main dam 3,121 feet and 1,690 feet long respectively, are being built of 260,000 cubic yards of colcrete, which is a mixture of stone and concrete. ICA has been testing colcrete in a small way in other projects, but this is its first use in

Continued on page 46

(Above) Two D8 dozers cut access road into mountainside during early phase of the Apulco project. (Below) An Eimco loader works in quarry that supplies Pioneer plant.

(Left) Aggregate for dam curtain is stockpiled. (Right) Concrete is poured for powerhouse structure which will house four turbines.



Bay City dragline strips one of the few deposits of volcanic sand in the area.

Mexico on a major project. Engineers estimate its use will save one-half the cost of concrete work; and, where less strength is demanded as on the dikes, it will serve equally as well.

On the curtain ledge one walks past the No. 2 tunnel opening to the compressor house. Here a Gardner-Denver and two Chicago Pneumatic stationary machines send power to the dikes and, indeed, to wherever needed in the Atotoyacan Valley. Naylor 6-in. tubing, totaling 12,316 feet, or over two miles, is used. Tubing snakes across deep ravines and ascends to the right dike, climbs cliffs and leaps over deep canyons to the left dike. Eighty-two Gardner-Denver rock drills are kept working.

Excavation for the left dike was still underway when this reporter visited the scene. Two Bucyrus-Erie 54-B's and one Link-Belt 360-K loaded Euclids. Ing. Luis Zarate is in charge of all excavation in the entire dam setup, totaling about two million cubic yards. He was resident engineer for the Zicuaran Dam in Michoacan *(Excavating Engineer,* October 1955). Three hundred and fifty grams of dynamite (.77 pounds) are used to move a cubic meter (1.3 cubic yards) of rock. From 65,000 to 130,000 cubic yards are blasted a month.

Ascending the muddy trail (as usual it had rained pitchforks the night before and in the early morning), we reached the rock quarry where a Manitowoc 2000 and an Eimco 105 were bailing into Euclids. Quarry run stones averaging thirty inches in diameter were hauled to one or the other of two Pioneer aggregate plants on the hillside.

Sand Plant

One plant (both were 24 by 36) fed a rod mill below. Equipped with a 27-ft. Goodrich belt and an Allis-Chalmers washer, it produces 30 tons an hour. A second sand plant had been ordered.

According to Ing. Norena, the worst problem of the entire job is the lack of sand so essential for the concrete work. The rivers fall so vertically down steep inclines, with but few stretches of lazy meanderings, that there are scarcely any sand deposits. Here and there is a flat area with sand of volcanic origin that is inadequate for good results. Most sand must be ground from rock and this adds about 20% to concrete costs.

ICA also harvests its own lumber, 20,000 board feet daily. Three thousand workers are housed in big collective buildings; some are family units;

(Left) Entrance to tunnel No. 2 shows the kind of tough rock excavation being encountered. (Right) Plymouth train returns to tunnel entrance after dumping load of rock.

others, bachelor quarters. These, and executive houses and work installations, are made of the local lumber. Incidentally, the most spectacular dining room in all the state of Puebla is that alloted to the workers of Apulco. Its terrace stretches far over the road below giving an unparalleled view of construction across the river and wooded slopes above.

Architect Jose Luis Buendia and Ing. Luis Garcia Junco, in charge of all building operations, are now designing concrete single-family permanent residences for workers with families. These will be equipped with all modern conveniences.

ICA equipment at Apulco includes seven Scoopmobiles, two Mixermobiles for making concrete, four Plymouth 6-ton tunnel trains, four Brookville 10-ton rock trains, 15 Euclids, 12 English Land Rovers, 10 dump trucks, three Eimco 40-H's, seven Cat tractors, four No. 80 scrapers, three Cat motor graders, four Gardner-Denver portable compressors, two Bay City shovels, two Link-Belts and two Bucyrus-Eries.

In the residential section of the ICA camp is a fully equipped hospital with Dr. Carlos Macias in charge, assisted by two other doctors and two nurses. After receiving competent emergency treatment, serious cases are sent to a hospital in Teziutlan, considered one of the best in Mexico.

Engineer Francisco Norena, one of four general managers of ICA, spends much of his time at Apulco, the firm's biggest job.

(Above) Directing the excavating is Ing. Luis Zarate. Two 54-B shovels are visible in cut. (Below) The dam's right dike which will be 3,121 feet long is slowly rising.

High-capacity Koehring 34E Tribatch, the first concrete paver to have a 3-compartment mixing drum, heads paving train at Marine Auxiliary air base in Yuma, Ariz. Sundt & Bovanda, a joint venture sponsored by M. M. Sundt Const. Co., Tucson, have a $4.1 million contract to pave runways and taxiways. Total concrete work is 140,000 yards.

NEWS *from the* FIELD

M-K Appoints New Executives

Harry W. Morrison, chairman of the board and president of Morrison-Knudsen Co., Inc., Boise, Idaho, has announced his retirement as president of M-K.

In his announcement, Morrison said he will continue to be actively engaged in the management of M-K as chairman of the board and that he is relieving himself of the responsibilities as president as part of a long-range program of planning to sustain company growth and diversification.

Succeeding him as president is J. B. (Jack) Bonny. A veteran of 30 years with the company, Bonny has been its vice-president and general manager since 1947. He is 57.

Morrison reported four other managerial changes as follows:

James D. McClary, formerly vice-president and assistant general manager, has been named executive vice-president—administration.

James N. Wells, formerly vice-president supervising the company's Los Angeles district and other field projects, has been named executive vice-president—operations.

Carroll F. Zapp, formerly vice-president and secretary, is now vice-president and general counsel.

Thomas L. Smith, formerly company attorney, has been elected corporate secretary.

H. W. Morrison

J. B. Bonny

Morrison said the position of general manager will no longer exist and that the new roster would more clearly define executive responsibilities—a step necessary because of M-K's broadened scope of operations.

Under Morrison's leadership, Morrison-Knudsen has grown to become one of the world's largest heavy construction and engineering firms with operations presently under way throughout the United States and 18 foreign countries. M-K and its subsidiaries last year completed nearly $240 million of work, and now have a backlog of nearly $400 million of contracts.

Bonny will continue to make his headquarters in Boise. He is a native of San Francisco and graduated in 1925 from the University of California. He joined the company in 1931 after operating his own construction firm for several years. He was appointed Los Angeles district manager in late 1932; became vice-president in 1943; a director in 1944; and moved to Boise four years later to become general manager.

Narrows Bridge Caisson Excavated

Cutting edges are being assembled for the huge concrete caisson that will support the Staten Island tower pier of New York's Narrows Bridge. The "sand island" through which the caisson will be sunk is enclosed by a cellular cofferdam of steel sheet piling.

Work is being done by a joint venture of two New York City contractors, J. Rich Steers, Inc. and Frederick Snare Corp. The joint venture's $16.5 million contract with the Triborough Bridge and Tunnel Authority calls for construction of the two tower caissons, one on each side of the Narrows.

Steers-Snare started the Staten Island project by building a rectangular cofferdam of 49-ft. diameter cells to provide about 10 feet of clearance between outer walls of the caisson and inner faces of the cells. The SP6A sheets, rented from the L. B. Foster Co., New York, average about 50 feet in length, and were driven in 30 feet of water. The Staten Island caisson will be 130 feet wide, 230 feet long and about 130 feet deep. Its counterpart on the Brooklyn side of the Narrows is roughly the same cross section, but will be about 200 feet deep.

Once the cutting edges are laid out, several lifts of concrete will be placed

Continued on page 50

These Special Excavating Jobs Are Best Handled by Sauerman DragScrapers

Deep Digging

900-FT. SPAN—65 FT. BELOW WATER...

Load is deposited by tensioning the track cable, thus lifting the DragScraper from the pile. Tensioning continues to the desired height for releasing the DragScraper and returning it by gravity to the pit.

Operator controls digging and hauling from cab in head tower.

"the 10-yd. DragScraper is doing a wonderful job and we could not operate without it..."

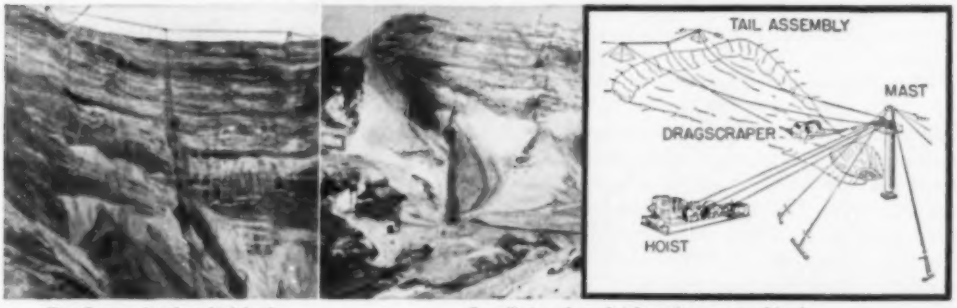
Louis Chinelli, Gen. Supt.
Redman Concrete Corp.

Redman had been trucking material at a cost of $35,000 a year to the location where the DragScraper is now placing it. The 10-yd. Sauerman covers a pond area of 1500′ by 3000′ and is digging 40 ft. deeper than their previous dragline could operate.

The DragScraper digs and hauls on a 900-ft. span. It operates between a 90-ft. fixed head tower and a 40-ft. mobile tail tower which may be shifted to change the line of operation. The company's 1000-yd.-per-day batch plants and its fleet of mixers and trucks are kept busy by the steady flow of material supplied by the DragScraper.

High Bank Digging

175 FT. HIGH—600-FT. HAUL...



DragScraper digs from high bank.

Overall view shows height and steepness of bank. Diagram shows details of Sauerman installation.

"I have nothing but praise for our 4-yd. Sauerman Machine. Since the DragScraper began operations in 1952, we have worked it continuously 12 hours a day..."

John D. Robertson, Gen. Supt.
Chandler's Palos Verdes Sand & Gravel Co.

By working down from the top of the 175-ft. bank, the material flows ahead of the DragScraper. This provides bonus loads on each haul and substantially lessens the danger of cave-ins.

Operating cables are powered by a Sauerman three-drum electric hoist. Equipped for rapid shifting, the DragScraper can be quickly positioned to any line of operation between the two tail towers at the top of the bank and the headpost at the hopper.

The plant is the largest sand producer in the South Los Angeles area and, together with two ready-mix plants, keeps 22 ready-mix and 18 dump trucks busy.

The best Sauerman Machine for your plant is governed by the nature of the deposit, location of material, the depth and plant layout. Consult Sauerman engineers about your plant. Their recommendations will be based on fifty years of excavating machinery experience. Ask for Catalog A (DragScrapers). Sauerman News Nos. 149 and 150 describe the above installations in greater detail.

SAUERMAN BROS. INC. 622 SOUTH 28TH AVENUE • BELLWOOD, ILLINOIS

CRESCENT SCRAPERS • SLACKLINE and TAUTLINE CABLEWAYS • DUROLITE BUCKETS

News . . .

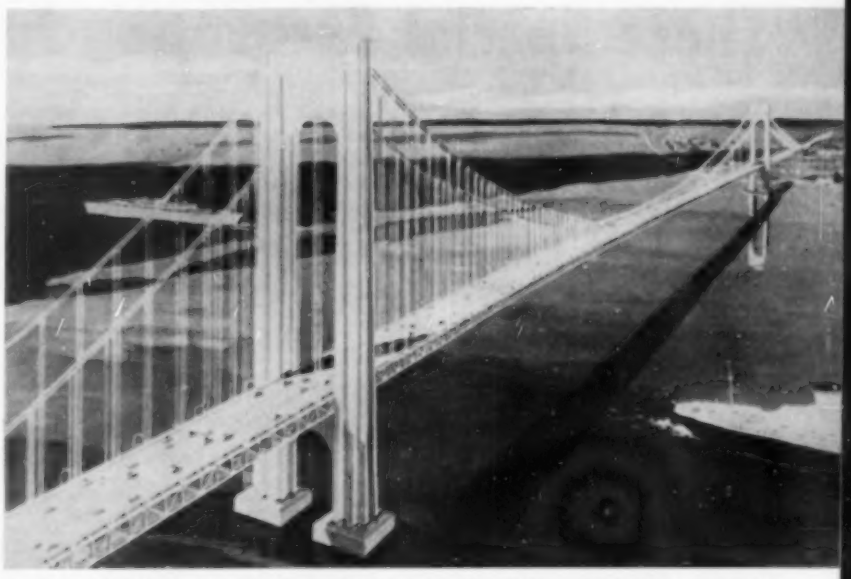
Continued from page 48

on top. The caisson will be sunk by means of dredging through a honeycomb of 66 circular wells 17 feet in diameter. It will be lowered in increments as additional lifts of concrete are placed on top. On the Staten Island side, the caisson is expected to be founded on a stratum of hard sand at elevation minus 127.

Designed by Ammann & Whitney, the Narrows bridge will have a suspended span of 4,260 feet and will be the world's longest. By way of comparison, the 4,200-ft. center span of the Golden Gate Bridge in San Francisco is currently the world's longest. Suspension towers will rise 690 feet above the top of piers. Estimated cost of the project is $320 million.

The bridge will extend across the Narrows between upper and lower New York Bay to link Brooklyn and Staten Island. It will connect the parkways and expressways of Long Island, Westchester and New England with the arterial systems of New Jersey and states to the west and south. Traffic will be able to by-pass the congested streets of midtown New York.

The double-deck structure will have 12 traffic lanes. The bridge will be 6,690 feet long from anchorage to anchorage, supported by 690-ft. steel towers in the water at either side of the Narrows. The roadway will be suspended from cables supported by the two towers. At its midpoint, the lower of the two decks will be 227 feet above water, providing adequate clearance for all commercial and naval shipping. The lower of the two sixlane decks will be opened to traffic first. The upper deck, to be constructed at the same time, will be opened at a future date, depending on traffic demands.



Narrows Bridge between Brooklyn and Staten Island will have a 4,200-ft. suspended span, the world's longest. Its builder is the Triborough Bridge and Tunnel Authority.

Expressway approaches to the bridge through Brooklyn and Staten Island are being provided with state and federal highway aid as part of the interstate highway system.

The future Clove Lakes Expressway, costing $37 million will extend 6.6 miles across Staten Island from the Narrows Bridge to the Goethals Bridge. In Brooklyn, the main approach will be by way of widened Gowanus Parkway and its extension along Seventh Avenue, estimated to cost $84 million.

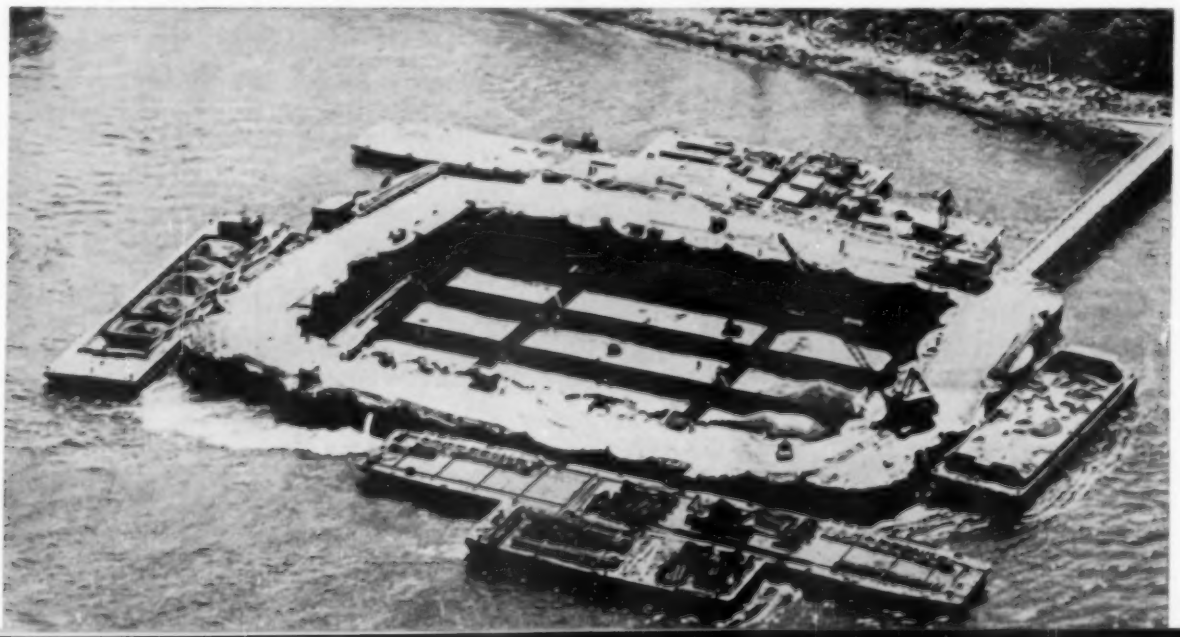
Utah Prospectors Find Rare Ore

A significant deposit of a new beryllium ore has been discovered in the Topaz Mountain area of Utah, approximately 150 miles from Salt Lake City.

Beryllium is used in the nuclear, missile and space industries because of its unusual properties of high

Continued on page 52

A huge concrete caisson will be built within this cellular cofferdam. The caisson will support the bridge's Staten Island tower pier.



HOW BIG?

Move material cheaper! Competition demands it . . . trucks and haulers are bigger to do it . . . excavator sizes are bigger and more efficient to meet the demand.

If you're thinking about **moving up,** think about the big SERIES TWO Bucyrus-Erie 71-B! Here's what you get: twin-governor, dual control of engines and torque converter — fine-line control of power and speed . . . different crawler mountings to fit your job conditions . . . a shovel or dragline front end that swings more payload, less dead load . . . diesel power as standard equipment (optional electric power available).

To stay ahead of competition, **think big** . . . move up to a Bucyrus-Erie SERIES TWO 71-B! Get the facts now . . . Bucyrus-Erie Company, South Milwaukee, Wisconsin. 39560

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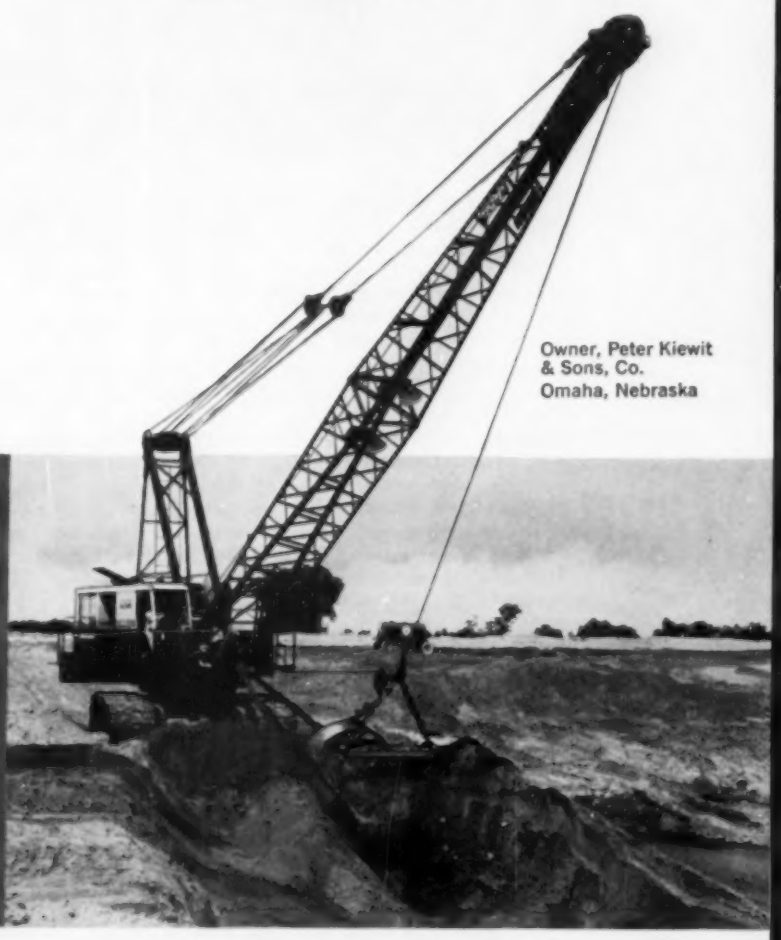
71-B

SERIES TWO



Owner, Peter Kiewit & Sons, Co. Omaha, Nebraska

most respected name in the field

BUCYRUS-ERIE

Philip Beauchamp recently started business for himself, general contracting in Reading, Massachusetts

"I BOUGHT THIS D6 USED. IT'S MAKING MONEY FOR ME!"

When a man goes into business for himself, he can't afford to take chances on his first machine, can he? As an operator, Philip Beauchamp was sold on Cat-built rigs, so he dropped in to see his Caterpillar Dealer. There he met a salesman who helped him with some friendly advice and showed him a fairly priced used "Bonded Buy" D6.

Actually, beyond his experience with Caterpillar equipment, the "Bonded Buy" guarantee influenced his decision. This is the safest buy in used equipment you can make anywhere. Exclusive on reconditioned Cat-built machines, it is a bonded guarantee—up to $10,000—of satisfactory machine performance and on *all* parts and labor during the guarantee period. Your Caterpillar Dealer, with his large selection of used equipment, also offers you two other types of protection—a "Certified Buy" and a "Buy and Try" deal on used units of any make.

Whether you're just beginning, middle size or a big contractor, you'll find as Philip Beauchamp did, you get your money's worth from your Caterpillar Dealer. He has a wide selection of reconditioned, classified and guaranteed trade-ins at fair, reasonable prices. He's interested in *your* needs and *your* problems and backs you with prompt service and parts you can trust. Don't buy "blind." See him —he's listed in the Yellow Pages.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

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BEST BUYS IN NEW AND USED EQUIPMENT

News . . .

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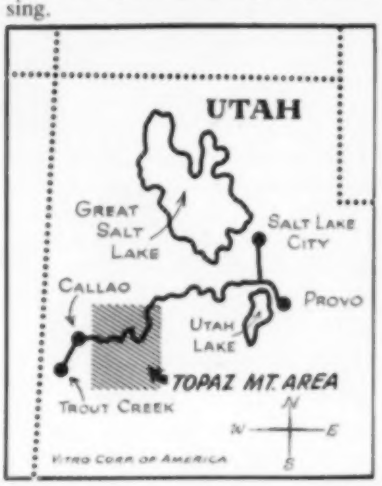
strength and light weight. However, development of the beryllium industry has been limited by its short supply and high cost. Beryllium is currently produced from the mineral beryl, which is picked by hand from pegmatite formations.

Officials of Vitro Minerals Corp., New York City, one of the largest claim holders in the Topaz Mountain area, said the new ore is found in disseminated non-pegmatitic deposits, much of it lying close to the surface where it can be mined by modern open-pit mining techniques. Studies by Vitro specialists indicate the new ore is readily soluble in sulfuric acid and is apparently amenable to conventional hydro-metallurgical processing.



It has been suspected for some time that this area of Utah contained beryllium. Active prospecting by major mining companies, however, was touched off by alert prospectors who discovered outcrops of the new ore. Although closely guarded, news of the ore discovery touched off a race to stake out beryllium claims reminiscent of the early days of the uranium rush.

Petrographic and mineralogical studies by Vitro geologists indicate the ore contains a new beryllium mineral. They have proposed to call it "vitroite." Laboratory studies to test the economics of processing the mineral are being conducted at Vitro's uranium plant at Salt Lake City.

For many years, the major application of beryllium has been in beryllium-copper alloy used in aircraft, business machines, electronics, radios,

Continued on page 54

The new No. 12 Series E Motor Grader spreads untreated base and handles cleanup for Massey Sand and Rock Company

THE NEW NO. 12E SETS THE STANDARDS

Widening U. S. 60-77-99 to a 4-lane limited-access highway, Massey Sand and Rock Company of Indio, California, recently added a new No. 12E Motor Grader to its Cat fleet. The improvements, effective with this new series machine, showed up immediately. As Tom W. Carter, manager of the firm, puts it: "The increased productivity of the new No. 12 was very noticeable. You can depend on new Cat products to give greater operator comfort and better productivity."

One of the big reasons for the new performance standards of the No. 12 is the new compact 115 HP engine. Incorporating the latest developments in metallurgy and design, this modern engine has greater lugging ability for the tough jobs, long life and easier servicing.

Caterpillar engineers did not stop with just a compact diesel. There's a new vertical starting engine to give easier, all-weather starting. The dry-type air cleaner is now standard—it removes 99.8 per cent of air-borne dirt every service hour, cuts maintenance.

Of course, the new No. 12 retains the dependable Caterpillar oil clutch that gives up to 2000 hours without adjustment; mechanical controls that engage easily; and plenty of throat clearance between moldboard and circle for improved rolling action.

See your Caterpillar Dealer. He'll show you—on your job—that the No. 12E lives up to what users are saying about it. He can also show you the 150 HP No. 14, the No. 112F with 100 HP and the No. 112E with 85 HP—they're built to be the best for the job.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

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THE NEW NO. 12 MOTOR GRADER BUILT FOR THE TOUGH JOBS

LOW COST
DE-WATERING
with
FLYGT
ELECTRIC
PUMPS
On a recent $23,180,000 Sewer Job in California, 8 separate contractors licked severe ground water intrusion on a pipeline excavation 19 miles long with more than 40 Flygt Electric, Submersible Pumps. The Flygt pre-dewatering systems drained and kept dry ditches along the right-of-way at low cost in comparison with other dewatering methods. Typical of contractor comments on the system is this statement by the J. S. Garrett Co., who placed 5½ miles of 78" line:
"You just drop Flygt Pumps in the hole, turn them on and make only routine inspections. They keep the ditch dry at realistic cost with none of the trouble normally experienced with suction-type pumps."
Flygt Electric, Submersible Pumps range from 1½" 85 gpm to 8" 3100 gpm capacity. Heads to 220'—higher in tandem. Designed and built for tough applications, they are adaptable to any dewatering job. Flygts run continuously with little attention, handle a high degree of solids, need no priming, are easy to handle and service. Ask today for literature and an on-the-job demonstration.
WRITE FOR NAME OF YOUR NEAREST DEALER
PUMP BETTER ELECTRICALLY
FLYGT
— USE FLYGT!
WESTERN SALES & SERVICE
Stance
MFGS. & SALES INC.
1400 Ninth St. (Corner of Olympic & Ninth)
Santa Monica, California

News . . .

Continued from page 52

electrical appliances and automotive parts. More recently, new applications have been developed in the nuclear and space industries. The metal's light weight and excellent structural properties make it ideal for certain aircraft and missile parts.

During 1959, according to Bureau of Mines statistics, domestic consumption of beryl hit an all-time high of 8,173 short tons while domestic production sank to 328 tons—its lowest point since 1948. Domestically produced, beryl sells at $520 a ton. Metal at 97% purity in bead or lump form is quoted at $71.50 a pound.

Electric Drive Earthmovers

A new line of heavy-duty construction vehicles utilizing four-wheel electric drive will soon be marketed by Electric Trucks, Inc., and Peters Co., Portland, Ore.

According to Electro officials, the line of electric drive machines will include scrapers, bottom and rear-dumps, and rubber tired tractors for pushing and dozing.

The electric drive, including generators, controls and motors, will be engineered and manufactured by General Electric at its Erie (Pa.) plant.

F & S Contracting Co., Butte, Mont., placed the initial order for the first unit of the new line.

It will get several 60-ton rear-dump vehicles that will have a maximum speed of 25 mph, and that can turn completely around in less than the truck's own length. The electric drive eliminates such standard truck mechanical parts as transmission, clutch, differential and axles.

F & S will use the vehicles in contract strip mining near Butte for the Anaconda Co.

Delivery of the first electric drive truck is scheduled this month.

Bradley Heads IH Division

Robert B. Bradley was named vice-president and executive head of International Harvester's Construction Equipment Division on July 1.

Previously president of International Harvester of Canada, Ltd., Bradley succeeds Harald T. Reishus, who is retiring.

He joined the company in 1929, as a salesman in the Oklahoma City (Okla.) district office. In 1954, Bradley was elected top executive of the Canadian company.

Reishus started with Harvester in 1923, as a member of the Minot (N. D.) district sales staff. He served in sales capacities at Fargo, N. D., and Richmond and Indianapolis, Ind.

Following tours of duty as district manager at Quincy and at Kankakee, Ill., Reishus transferred to the Chicago general office in 1940 as sales manager of used motor trucks and tractors. Later, he was named manager of the eastern sales region.

R. B. Bradley

H. T. Reishus

Harvester formed its Construction Equipment Division in 1944, and Reishus was appointed general manager and executive head. He was elected vice-president in 1953.

Company president Frank W. Jenks commended Reishus' long service.

Under his tenure, Jenks said, the division has had a strong growth in sales, with progress recorded in enlarging and completing the line of construction equipment products.

Headquarters of the division are at Harvester's Melrose Park (Ill.) works.

The Last Revision

The draftsman and the engineer
Are men of skill and vision.
At least they are until they hear
That hated word: Revision!

The engineer with practiced eye
Surveys his grand design.
The draftsman then expertly draws
Each complicated line.

"Complete!" they sigh contentedly,
"Miraculous precision!"
Oh, optimists! Tomorrow brings
Catastrophe . . . revision!

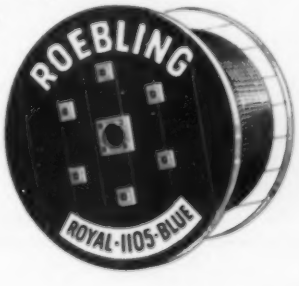
Revision one adds this new piece.
Revision two improves it.
Revision three makes it just right.
Then number four removes it.

"You can't do this; you can't do that,
We'll wait for a decision.
But in the meantime, just revise
That last revised revision."

Revise . . . revise . . . the very word
Fills engineers with dread.
Though die they must, they'll be revised
To make damned sure they're dead.

We hope that God's no engineer
When He makes His decision.
If once they win their wings they hope
There'll be no last revision!

When you're talking about a $162,000 dipper shovel, you've got to talk about the best rope for it



Talking about or working with, the same thing applies. Anything below Royal Blue's performance level is simply unrealistic. Like looking for a cut-price brain surgeon.

Even at $162,000, the cost of wire rope is important. That's why so-so ropes can cost you more in the long run, because so-so ropes are *short run*. Royal Blue, on the other hand, is built by America's oldest manufacturer of wire rope to last, to do the job without a whimper. Here's why.

Royal Blue is made from the toughest rope wire ever made—Type 1105—extra high-strength improved plow steel. This pedigree gives to the rope qualities that you can't find in any other rope: exceptional resistance to shock, abrasion, fatigue and impact. Add to these a flexibility that age cannot wither nor hustling fade and you've got a collection of characteristics that make Royal Blue the strongest rope you've ever used.

A $162,000 Dipper Shovel deserves the best and your Roebling Distributor has it . . . Royal Blue. Any inquiries about this high-born rope will be answered immediately by Roebling's Wire Rope Division, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities

John A. Roebling's Sons Division • The Colorado Fuel and Iron Corporation

Here's why the low-cost Bucyrus-Erie 11-B

is productive more of the time!

There are more time- and money-saving features on this high-speed mobile crane-excavator than any other in its class! From top to bottom it is clean, easy to maintain, easy on the budget. The 11-B is the kind of profit machine that is *not only more productive* but productive more of the time . . . take a look!

2-Section Cab Lets You Get to Machinery Fast!

The streamlined 11-B cab has folding and sliding panels that open up to let you get at the entire main machinery. You can see what you're doing . . . the machine gets back on the job sooner!

Save Clutch Adjustment Time!

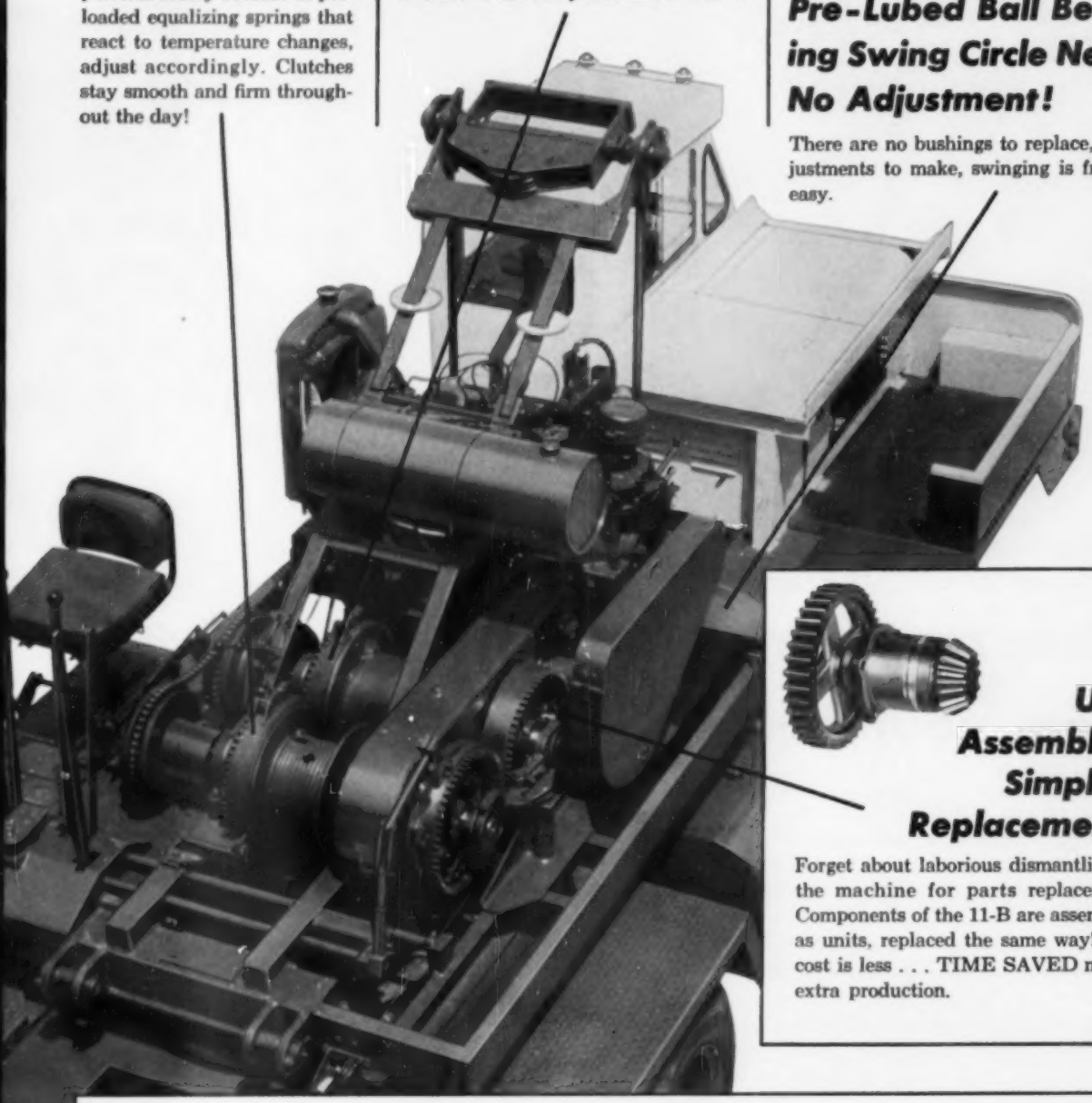
Warm or cool, 11-B clutches perform evenly because of preloaded equalizing springs that react to temperature changes, adjust accordingly. Clutches stay smooth and firm throughout the day!

Clutches Identical... Parts Interchangeable!

Bands are reversible for longer wear; one set is an adequate reserve stock!

Pre-Lubed Ball Bearing Swing Circle Needs No Adjustment!

There are no bushings to replace, no adjustments to make, swinging is free and easy.



Unit Assemblies Simplify Replacements

Forget about laborious dismantling of the machine for parts replacement. Components of the 11-B are assembled as units, replaced the same way! The cost is less . . . TIME SAVED means extra production.

BUCYRUS-ERIE

SOUTH MILWAUKEE, WISCONSIN

18E59

How to get maximum service from your boom pendants

The next time you purchase cranes or power shovels, or re-rig existing equipment, be sure to specify Bethlehem Boom Pendants with swaged fittings.

Research clearly proves that these pendants are superior to pendants with spliced, socketed, or sleeve-type fittings. These superior pendants make ideal boom supports because they are engineered to absorb punishment caused by shock and vibration. They are made of Bethanized rope, which means that each wire is zinc-coated electrolytically, then drawn to size, to provide maximum resistance to fatigue and corrosion.

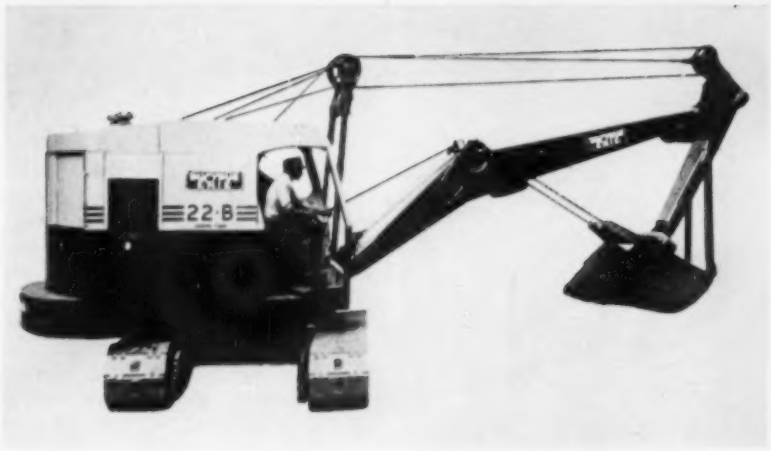
Maintenance costs are reduced, for there is no need to constantly re-lubricate. Bethlehem Boom Pendants can also be fabricated of uncoated wire.

Bethlehem Boom Pendants are furnished in diameters, lengths, and styles to meet virtually every construction requirement. If you want full details, just call the nearest Bethlehem sales office.

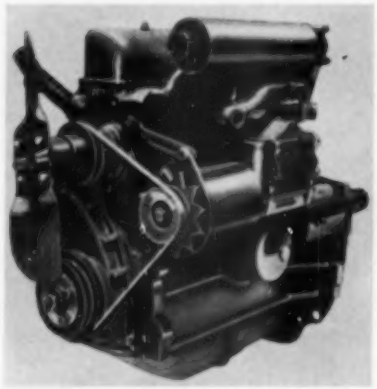
BETHLEHEM STEEL COMPANY, Bethlehem, Pa. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Equipment You Ought to Know About



Industrial Engines



Manufacturer: Ford Div., Department EE, Ford Motor Co., P.O. Box 608, Dearborn, Mich.

Claims: Ford has added two new industrial engines to its lineup of heavy-duty engines and power units.

The engines are a 292-cu. in. gasoline engine and a compact 172-cu. in. four-cylinder diesel. Each new engine also is offered as a ready-to-run power unit complete with instrument panel, radiator and sheet metal housing.

The new diesel model features parts that are interchangeable with Ford's 172-cu. in. gasoline engine, including cylinder sleeves, exhaust valve rotors, exhaust valve seat inserts, intake and exhaust valve guide bushings and hard-faced exhaust valves.

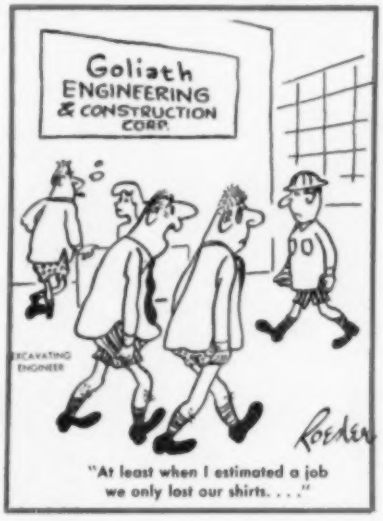
Ford Division's Industrial Engine department now offers nine gasoline engines and three diesel engines. The company has doubled its industrial engine lineup in the last two years, and now can meet most power requirements with engines that range in cubic inch displacements from 134 to 534.

Series Two 22-B

Manufacturer: Bucyrus-Erie Co., Department EE, South Milwaukee, Wis.

Claims: Bucyrus-Erie is introducing a new Series Two of its 22-B crane-excavator with added features and improvements. It is available as a crawler, carrier or wagon-mounted machine, fully convertible for crane, dragline, clamshell, hoe or shovel service.

Longer machine life, trouble free operation, and minimum upkeep are advantages claimed through these new features: adjustable hook rollers; splined horizontal propel shaft; alloy bronze bearings for propel machinery; splined clutch for quick shift swing-propel; surface hardened gear teeth; remote control lubrication of swing gear and pinion; improved swing clutch bearing seals; and improved crawler frame construction with shielded rollers and bearings.



Faster, smoother operation and increased production are achieved through refined brake-cam action and larger capacity of boom hoist; full wrap main brakes; three-tooth, twin-spring house lock; improved propel and crowd chain sprocket teeth; friction type governor control; larger capacity drums; and optional twin governor dual control of torque converter speed and power combinations.

On the 25-ton capacity Transit Machine, additional new features include: high strength alloy steel booms up to 110 feet long with bolt or pin connections; 12-part suspension with anti-friction bearing-mounted sheaves; choice of 6x4, 6x6 or 8x4 carriers with gas or diesel power; removable rear outriggers plus optional aluminum floats for jack screws on outrigger beams; heavier, stronger A-frame; power load lowering, and eight conical hook rollers. Hydraulic outriggers with both horizontal and vertical movement are available.

Steel Walkway Grating

Manufacturer: Bustin Steel Products, Inc., Department EE, Dover, N. J.

Claims: A new assembly of Protectoway safety grating platform sections for building gangways is now available to "do-it-yourself" industrial erectors. These safety platforms are ideal for equipment where personnel must walk up and down steep inclines and for places where grease or viscous substances cause slippery conditions. They also serve in areas exposed to inclement weather where snow, ice coatings, weight and wind resistance

Continued on page 60

New Equipment . . .

Continued from page 59

present a safety engineering problem.

The basic safety flooring assembly is all resistance welded by a unique new method that eliminates the use of bearing bars. Protectoway safety sections, ready to erect, are available in a wide selection of sizes welded to supporting rails as determined by safe load requirements.

Motor Graders

Manufacturer: Caterpillar Tractor Co., Department EE, Peoria, Ill.

Claims: Three new models of Caterpillar motor graders, have major improvements that substantially increase machine productivity. New design, compact engines, as well as other new features, have been released for all three machines—the No. 112E, the No. 112F and the No. 12E.

Introduction of the new No. 112 Series F amounts to addition of a fourth machine to the company's motor grader line, a spokesman said.

The No. 112F is powered by a turbocharged, four cylinder diesel engine rated at 100 horsepower. Horsepower of the No. 112 Series E has been increased to 85, an increase of 13% over the previous model. The No. 12E is rated at 115 horsepower.

Both the No. 112E and No. 112F incorporate the Caterpillar oil clutch; improved blade controls; a one-piece transmission and final drive case; and the recently developed dry-type air cleaner.

Prime feature of the new, compact diesel engines is a higher torque rise that gives the graders more "staying power" when pulling through heavy loads. In addition to increased performance, design features of the new engines guarantee long service life and easy accessibility for maintenance and servicing. In all three engines, the air intake manifold is cast integrally with the cylinder head, reducing the possibility of dirt entry.

The No. 112E and No. 112F motor graders are the only ones in their size class equipped with an oil clutch, Caterpillar says. This clutch has the advantages of long service life and requires only minor adjustments each work season. An oil film between the clutch plates reduces wear and aids in heat dissipation.

Positive assurance against moldboard creeping is provided by a new control lock, and smoother control lever engagement results from adoption of a new two-tooth jaw clutch on both the No. 112E and the No. 112F.

Side slope workability of the No. 12 Series E has been improved through lowering of the machine's center of gravity. Without disturbing the favorable weight to horsepower ratio, the design gives greater stability than on previous models by increasing weight in the wheels.

Adjustment of the side shift rack on the new No. 12 also is now possible through a split arrangement. The rack is installed with shims, which can be removed as necessary to compensate for wear.

All three of the new diesel engines are equipped with the new dry-type air cleaner. Composed of a precleaner and two filter elements, this cleaner has an efficiency of 99.8% even under the most severe conditions. The precleaner removes the majority of foreign elements from the air and the main element takes out the remaining filterable particles. A secondary element acts as a safety in the event the main element receives undetected damage.

V-8 Truck Tractor

Manufacturer: White Motor Co., Department EE, 842 E. 79th St., Cleveland 1, Ohio.

Claims: A tractor with V-8 engine and bumper-to-back-of-cab dimension of only 90 inches is the newest addition to the White heavy-duty tractor line.

The 9000TV tractor is for transport jobs in the 65,000 to 80,000

Continued on page 64

...in everyone's price range!

Air-powered Quick Shift, swing to propel on crawlers.

Full-visibility cab that lets you see in all directions.

Choice of gas or diesel power.

Mechanical controls for the upper works . . . **Air Control** for steering and propel.

Direct drive, 3-speed transmission or torque converter drive.

Handles ½ and ⅝-yard dragline and hoe buckets to suit job conditions.

Full-paneled cab for easy access all around.

Full convertibility to hoe • crane • dragline • clamshell • shovel.

Enclosed gears on main machinery, running in oil.

Remote lubrication grease gun for swing gear and pinion.

Ball bearing swing circle adjusted for life at the factory.

Involute splined shafts in upper works and crawlers.

Identical, interchangeable operating clutches and brakes on main shafts.

Color code lube guide.

Crawler outriggers to boost standard crawler capacities by 15%.

Crawler or Transit Machine, take your choice and get the best buy on the market for *work* capacity and *lift* capacity and *profit* capacity in a price range that's the best news of all!

most respected name in the industry... BUCYRUS ERIE®

35E60

new 14-B

announcing 5 NEW MARIONS

MARION POWER SHOVEL COMPANY

A Division of Universal Marion Corporation

MODEL	SHOVEL (CU. YDS.)	BACKHOE (CU. YDS.)	CRAWLER CRANE CAPACITY (TONS)	PCSA RATING
45-M	1⅛	1¼	30	10-102
47-M	*	1¼	40	12-141
65-M	1½	1½-1⅝	50	12-165
75-M	1¾	2-2¼	60	12-204
77-M	*	2-2¼	75	12-278

*Not Available as a Shovel.

Now — power-packed and ready to go, you'll find this new series of Marion machines offer the versatility in range and capacity to fit your specific needs. New! From the ground up! Major excavator design improvements that let you "custom-select" standard and optional features as they are needed. And, they can be added or removed on the job site! 13 different front end combinations . . . 4 different power and transmission arrangements . . . and a host of work-saving optional features combine to do swift justice to any of your job requirements, from a simple trenching operation to a multi-million dollar highway project. In league with six other basic models in Marion's contractor line, you'll find dipper ratings from ¾ to 5 cubic yards . . . crane capacities from 15 to 100 tons. Which Marion is best for your job? You can get a ready answer from your nearest Marion distributor.

"the fastest growing line in the industry"

Marion, Ohio, U.S.A.

MARION

ATTENTION

dealers...distributors!

Hop on the **WINKIE** bandwagon! Add this low-priced, versatile product to your present lines. Call or write us immediately for details, advising us of products, markets, and areas you now cover.

GROUT HOLES?
EXPLORATION?
TEST CORES?
MASONRY DRILLING?
UTILITY CONDUITS?
MARINE BLAST HOLES?

designed for YOU . . . whatever Your Drilling Needs!

That's the Winkie diamond core drill—an invaluable tool for contractors, plumbers, concrete masons, utility maintenance men, miners, geologists, test borers, etc.

It weighs only 45 pounds . . . sets up in 5 minutes for grout-hole drilling, concrete coring, exploration, testing and probing, and many other specialized applications. It drills at any angle . . . fast, economically; requires less rechucking, less fuel; cuts cool clean cores . . . to 200 feet! AND you'll never burn a bit with a Winkie! 9W60

Write us TODAY for complete facts on an all-round lightweight drill that'll rewrite footage records!

BUCYRUS ERIE ®

SOUTH MILWAUKEE
WISCONSIN

The Super Mustang engine has a displacement of 440 cubic inches, compression ratio of 7.3 to 1, and features replaceable wet-type cylinder sleeves, high-velocity cooling plus modern short-stroke design.

Hoe Attachment

Manufacturer: Burg Mfg. Co., Department EE, Waverly, Neb.

Claims: A new Burg attachment for hoe excavators allows the operator to select the best boom length for digging conditions. It gives 13 feet of variation on a ¾-yd. hoe. Maximum boom length is 23 feet; minimum 10 feet.

The manufacturer's specifications indicate that the variable length boom feature allows a ¾-yd. machine to dig 10 feet of level floor at 20-ft. depth, with maximum digging depth 23 feet. An average basement can be dug with as few as four sets of the machine, the Burg firm claims. Other advantages claimed for the machine are that line and grade can be better maintained; footings can be more accurately dug with the same machine; trenching in restricted areas and around service lines is facilitated; and dirt can be moved farther from the excavation.

New Equipment . . .

Continued from page 60

pounds GCW range. It features an 8-235A Super Mustang engine which develops 235 hp at 3,400 rpm and a torque of 412 foot-pounds at 2,400 rpm.

Available wheelbases of the tractor are 128 to 164 inches and CA (back of cab to centerline of rear axle) dimensions 66 to 102 inches. Standard equipment on the 9000TV are the 530B transmission, 115D front axle with 8,500-lb. rated capacity, and 124C rear axle, at 20,000-lb. capacity.

Its single-channel frame is constructed from heat-treated chrome manganese steel and measures 8¼ x $2^{15}/_{16}$ x ¼ inches. An all-bolted construction procedure enables White to use high-strength material in the 9000TV and offer simplified bumper and fender removal to reduce maintenance downtime and expense.

White offers a selection of wheelbase sizes, axles, transmissions, powerplants, frames, clutches and other components.

Fuel Oil Filter

Manufacturer: Wix Corp., Department EE, Gastonia, N. C.

Claims: An improved method of packaging diesel fuel oil filter cartridges has been introduced by Wix. Each cartridge is now encased in a tough, transparent polyethylene envelope that resists tearing and damage.

This wrapper is thermal-sealed to prevent any contamination of the prescription filtration cartridge by dust or moisture. An additional benefit, says the manufacturer, is the ease of identification. Not only is the cartridge label immediately visible, but also the over-all appearance of the cartridge.

Wix filter cartridges for diesel service are expressly engineered for selective filtration for lubricating and primary and secondary fuel filters, plus bulk fuel oil station filters. Wix reports that its individualized filtrants improve diesel operation and contribute to maintenance economy.

Power Blade Dozers

Manufacturer: J. I. Case Co., Department EE, Racine, Wis.

Claims: Case utility dozer units are now available with power-angling or power-tilt blades. Previously offered on larger Case industrial crawler tractors, these hydraulic-powered blades can now be mounted on 42-hp model 310 utility crawlers.

The model 310 power-angling dozer allows the operator to angle the blade 25° left or right without stopping the tractor to move the blade into correct position by hand or other means. When side casting, he can turn around at the end of a long pass, reverse the angle of the blade from cockpit, and "doze" in the opposite direction.

On short passes, the operator can back up, adjust the angle and start a new cut, or can start cut and adjust blade angle "on-the-go." Power to angle blade is supplied by two double-acting hydraulic cylinders mounted on the A-frame behind the mold-

Continued on page 67

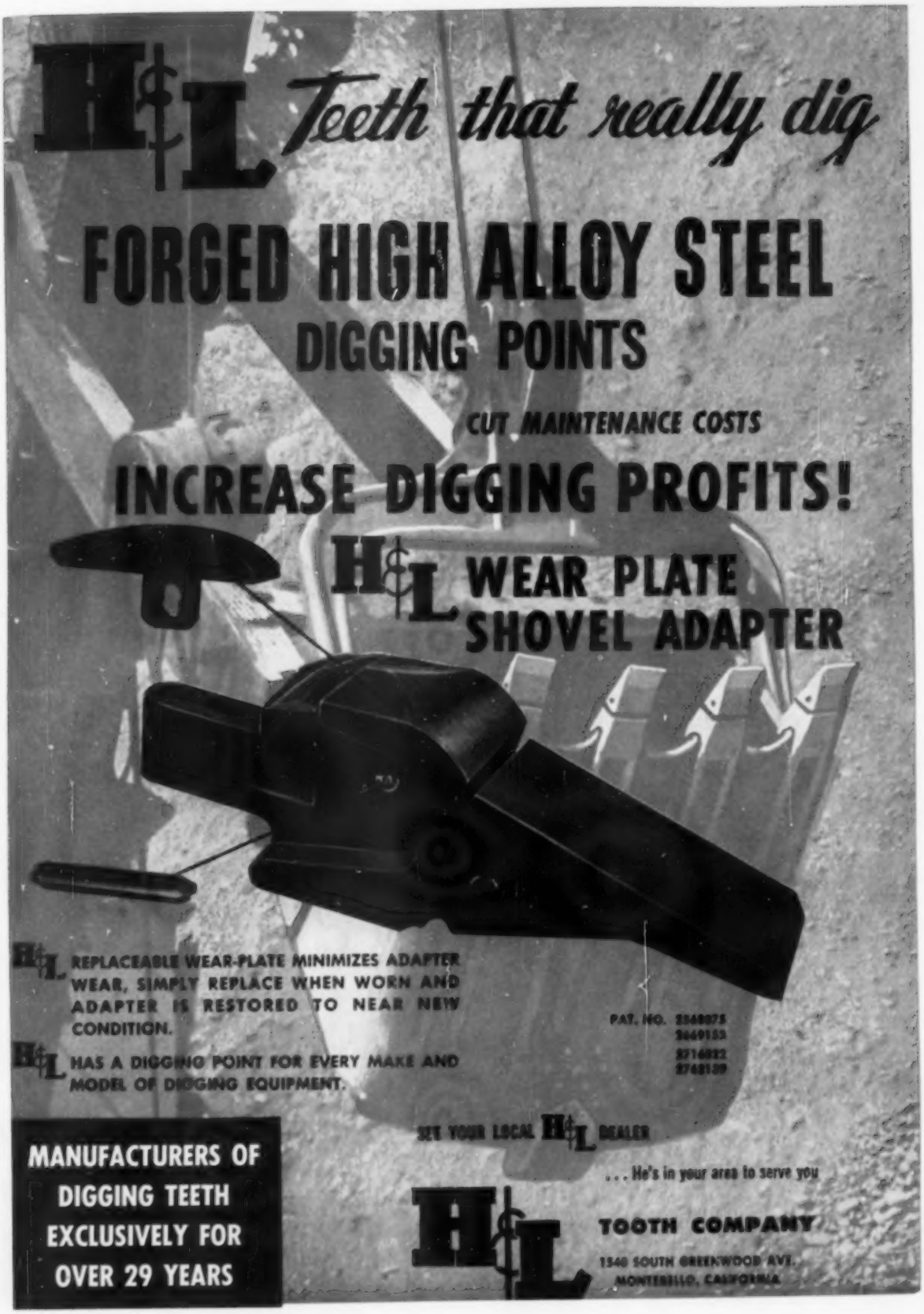
Marion Long-Life Hopper Trailers

FOR FAST, LOW-COST HANDLING OF COAL, AGGREGATE, ORE

Look at the performance-proven facts!

• SAVES TIME when dumping—you get more round trips which means more payloads. • MINIMUM MAINTENANCE—there's little to get out of order. • RUGGEDLY BUILT to withstand severe usage. • SINGLE AND TANDEM AXLE units for highway use according to state road law. FOR OFF-HIGHWAY use in coal, aggregates, ore. • CAPACITIES—10 to 100 cubic yards. • CENTER PARTITION available to provide two compartments for better load distribution and extra side support. • DOUBLE OR SINGLE sets of doors lengthwise or cross doors for dumping and spreading. • IDEAL FOR CONTROLLED SPREADING of aggregate on road jobs with power operated or manual door opening. • EACH HOPPER is job engineered to fit your operation and the material to be hauled. Your nearby Marion Distributor will be glad to give you full details on Marion Hoppers best suited to your operation. Marion makes a complete line of hydraulic hoists and dump bodies.

MARION METAL PRODUCTS CO.
Marion, Ohio, U.S.A.


H&L Teeth that really dig
FORGED HIGH ALLOY STEEL
DIGGING POINTS
CUT MAINTENANCE COSTS
INCREASE DIGGING PROFITS!
H&L WEAR PLATE
SHOVEL ADAPTER
H&L REPLACEABLE WEAR-PLATE MINIMIZES ADAPTER WEAR, SIMPLY REPLACE WHEN WORN AND ADAPTER IS RESTORED TO NEAR NEW CONDITION.
H&L HAS A DIGGING POINT FOR EVERY MAKE AND MODEL OF DIGGING EQUIPMENT.
PAT. NO. 3568375
3649153
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MANUFACTURERS OF DIGGING TEETH EXCLUSIVELY FOR OVER 29 YEARS
SEE YOUR LOCAL H&L DEALER
. . . He's in your area to serve you
H&L TOOTH COMPANY
1540 SOUTH GREENWOOD AVE.
MONTEBELLO, CALIFORNIA

New Equipment . . .

Continued from page 65

board, where they are protected from brush and rocks. Angle of the blade is conveniently controlled from the tractor seat by a dash-mounted hydraulic lever.

The 310 hydraulic tilt-dozer is designed especially for road crowning; ditching; digging out trees; breaking up hardpan; and maintaining level grades in rough terrain. Its blade tilts to either side while the tractor is in motion. To tilt left corner of blade

up to 11 inches below grade, the operator pushes a hydraulic lever located on the dash. Pulling the same lever levels it or tilts the right corner down. Power is provided by a large hydraulic cylinder mounted on left push arm, and attached to upper rear corner of blade.

The Case 310 utility tractor develops 29 drawbar horsepower, and delivers up to 5,815 pounds pull and push. It is powered by a 4-cylinder Case engine, and has a shuttle-shift transmission as standard equipment.

One-Man Trencher

Manufacturer: Arps Corp., Department EE, New Holstein, Wis.

Claims: The new Arps model MA-2 Trench Devil is a one-man operated trencher. Contractors, utilities, municipalities and custom workers can use it for jobs such as gas lines, water services, foundations, electrical and telephone cable, and signal and sprinkler systems.

Weighing approximately 1,080 pounds, the trencher can be easily skid-loaded on pickup trucks or small trailers, or it may be transported for short distances under its own power at 3 mph. During transport, if the operator removes his hand from the control handle, the machine automatically stops to insure complete safety.

There are five digging widths—2¾, 3½, 4, 6 and 8 inches. Maximum digging depth is 54 inches. Digging speed is variable from 0 to 1,200 feet per hour in either direction. At the 2-ft. depth, digging speed averages 205 feet per hour with an 8-in. width; at 4-ft. depth, speed averages 105 feet per hour at a 4-in. width.

A new depth marker accounts for fast, accurate trenching. When digging depth is reached, a pointer is set in line with a marker. Successive raising and lowering of the boom always brings unit back to the desired depth without any additional measuring.

One-side dirt delivery is handled by a reversible conveyor which can be changed to either side within 60 seconds. One crumber can be used for 2½, 3½ and 4½-ft. booms. Optional rear dual wheels provide extra traction and flotation in muddy soils.

Double-Acting Hammers

Manufacturer: McKiernan-Terry Corp., Department EE, Dover, N. J.

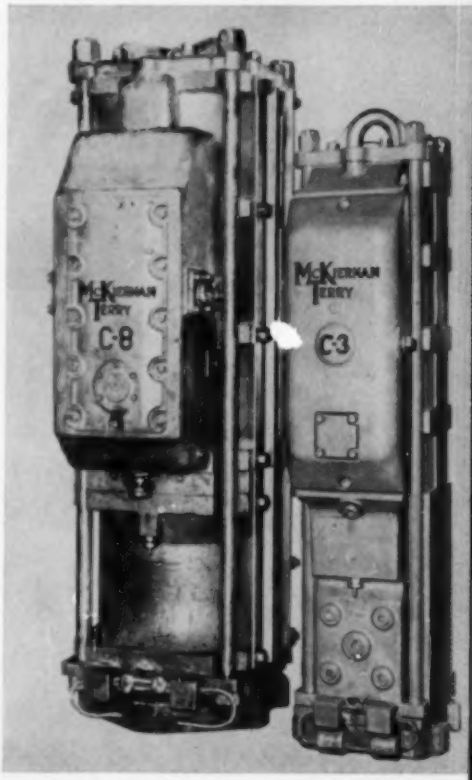
Claims: Two new C-type double-acting pile hammers, designated as models C-3 and C-8, have been added to the McKiernan-Terry line to meet a broader range of pile driving requirements.

Both follow the design of the basic C-5 hammer and its all-new operating cycle which allows a high rate of energy output at low steam or air consumption. The line features self-seating valves that eliminate need for additional air or steam as the hammer ages, and high-speed operation combined with low striking velocity comparable to that of single-acting hammers.

The 8,500-lb. C-3, delivering 130 to 140 blows per minute in average driving, works with either a 500 or 600-ft. air compressor, or a McKiernan-Clayton steam generator (WOM 110) utilizing 1,350 pounds of steam per minute. Because of its unique operating cycle, the C-3 can double the work of other hammer types on a given volume of steam or air. Its work scope covers wood piles, most gauges of steel sheeting, and other piles of up to 60-ton bearing.

The C-8 operates with a 900-ft. air compressor or the McKiernan-Clayton (WOM 110) steam generator at 2,600 pounds of steam per minute. It delivers 77 to 85 blows per minute, and weighs 18,750 pounds. It is designed to drive heavy piles—pipe, concrete, and H-beam—to bearings of up to 125 tons.

Like the C-5 hammer, the C-3 and C-8 have the ram over-travel safety feature which prevents damage to the one-piece ram and to hammer parts if the pile breaks or suddenly drives



through a soft strata leaving the anvil block unsupported. In either case the hammer will not function. The C-type hammers need not be throttled when starting a pile, or when using the "free-hanging" method of driving.

C-type hammers are completely enclosed, protecting the mechanism from sand and dirt damage, and safeguarding workmen. Their Dualtube lubrication systems feature a differential pressure lubricator.

FAST
Especially designed cutting blade and dies of the finest steel assure fast cutting action.

EASY
Anyone can operate it. The hammer principle eliminates any special skill requirements.

SAFE
The enclosed cutting blade locked in the body of the cutter assures perfect safety.

PORTABLE
Models for tool kit or stationary operation. Made in three sizes.

SEE YOUR DEALER OR WRITE TO
MORSE-STARRETT PRODUCTS CO.
1204-49th AVENUE • OAKLAND 1, CALIF.

NEW Trade Literature

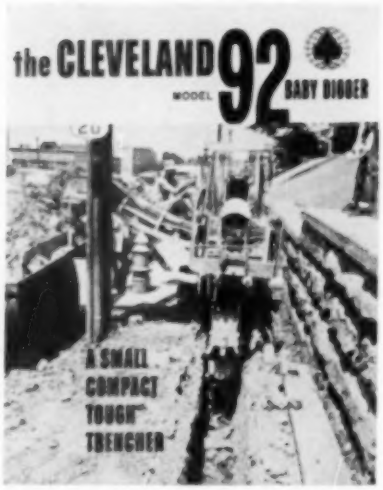
Subject: **Side-Dump Trailers**

Content: An 8-page booklet describes the Easton line of side-dumping truck bodies, trailers and trailer trains. Easton pan-type trailers are specially developed for shovel-to-crusher hauling in mines and quarries. They are dumped at a fixed point by means of the Easton automatic electric overhead dumping system, pushbutton-controlled from the crusher attendant's station. Load capacities range from 14 to 36 tons. Drop-door trailers provide flexibility needed for dumping to a fill, to a windrow, or to a fixed point of discharge. As the body is raised for dumping and then lowered to riding position, the side door opens and closes automatically. The drop-door trailers are available in several body styles with capacities from 14 to 40 tons. Side-dump truck bodies incorporate the basic body features developed for pan-type and drop-door trailers, and permit application of the side-dumping principles to jobs where extra traction and climbing ability are required. They are available in 14, 20 and 36-ton sizes for mounting on off-highway trucks and 14 and 17-ton sizes for mounting on six-wheel trucks. The various trailer and truck bodies are also adaptable to multiple-unit trains for long-distance hauling.

Where to get: Easton Car & Construction Co., Department EE, Easton, Pa.

Subject: **Compact Trencher**

Content: A 12-page folder describes the Cleveland model 92 built for city and suburban work. The model 92 digs trench 10 to 20 inches wide, down to 5 feet deep. It puts the edge of a trench within 17 inches of poles, hedges, fences and other structures. Brief copy and action photographs illustrate the new trencher on typical jobs like—gas, water, sewer, telephone and



power lines; building footings; highway, airport and railroad cable and drainage jobs. Complete dimensions and specifications are included. Ask for bulletin L-108.

Where to get: Cleveland Trencher Co., Department EE, 20100 St. Clair Ave., Cleveland 17, Ohio.

Subject: **Engine Catalog**

Content: A 12-page catalog describes International six-cylinder interchangeable diesel and carbureted engines. It deals with the UC-221 carbureted and UD-236 diesel engines, rated at 75 maximum horsepower, and the UC-263 carbureted and UD-282 diesel units, rated at 95 maximum horsepower. Ask for catalog CR-608-I.

Where to get: International engine distributors and dealers, or International Harvester Co., Department EE, 180 N. Michigan Ave., Chicago 1, Ill.

Subject: **1¼-Yd. Excavator**

Content: An 8-page catalog discusses the Manitowoc 1¼-yd. model 2000 Shovel, which is convertible to crane, dragline and trench hoe. The booklet contains a large number of photos used to illustrate the crawler base; Manitowoc Power-Flo train; upper deck features; simple counterweight removal; and ease of shipment on trailers or rail.

Where to get: Manitowoc Engineering Corp., Department EE, Manitowoc, Wis.

Subject: **Euclid Crawler**

Content: Euclid has published a 24 page report on a year-long demonstration of its new model C-6 tractors in the Pacific Northwest. Well-illustrated with working views, the booklet describes the types of operations where the 211-hp (net) tractor was used by loggers, road contractors and other industries. Ask for form No. 608.

Where to get: Euclid dealers or Euclid Div., General Motors Corp., Department EE, Cleveland 17, Ohio.

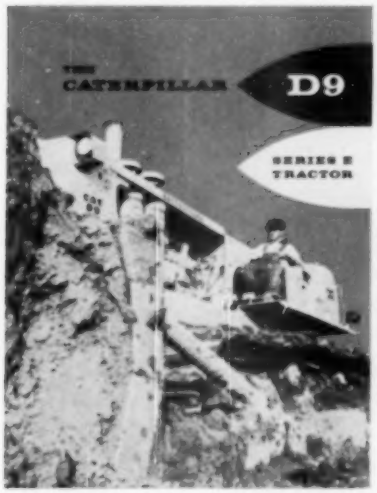
Subject: **Batch Plant Equipment**

Content: Johnson automatic electromechanical controllers and recorders for concrete batching are described in a 6-page brochure. Among the types discussed are a 60-mix controller-recorder for cement, water and multiple aggregate batchers; a 120-mix controller-recorder for single material batchers; automatic beam scales for inexpensive precision batching without mix selection; an automatic dial head for fast, accurate weight set-

ting; an electronic batch recorder which prints all charts and records on one roll; a standard beam box for manual weighing of four materials; and electronic batch controls for ready-mix or concrete block and pipe plants.

Where to get: C. S. Johnson Div., Koehring Co., Department EE, Champaign, Ill., and Stockton, Calif. In Canada, Koehring-Waterous Ltd., P.O. Box 490, Brantford, Ont.

Subject: **D9 Tractor**



Content: Latest improvements to the Caterpillar D9 Series E tractor are described and design features explained in a 16-page booklet. The 335-hp D9 is available with three different transmissions—direct drive, Power Shift and torque converter. Advantages, operating characteristics and maximum drawbar pounds pull available with each type are given. A complete listing of matched equipment available for use with the D9 is also included. Ask for form 33443.

Where to get: Caterpillar dealers or Caterpillar Tractor Co., Department EE, Peoria, Ill.

New Movies . . .

Subject: **All-Hydraulic Scraper**

Content: A new 15-minute, full-color and sound movie, *Look to the TS-360,* has been produced by Allis-Chalmers. It explains the production, operating and mechanical advantages of the 30-cu. yd. TS-360 motor scraper without using the everyday "nuts and bolts" approach. The TS-360 story has been woven around the theme of a contractor designing an all-hydraulic motor scraper to meet his actual field requirements.

Where to get: Allis-Chalmers Mfg. Co., Tractor Group, Department EE, Box 512, Milwaukee 1, Wis.

Subject: **Prestressed Concrete**

Content: A new film explaining the principles and uses of prestressed concrete has been made available on loan for free public showing by Calaveras Cement Co., a division of Flintkote Co. Narrated by Professor T. Y. Lin of the University of California, who is recognized as one of the world's foremost authorities on the subject, the film covers the history and future of this form of construction in addition to describing its present applications. The viewer is taken to construction jobs where prestressed concrete units are being installed, as well as into representative plants where huge concrete beams are formed on factory-like assembly lines. The 16mm film is entitled *Prestressed Concrete.* It runs 22 minutes in sound and color.

Where to get: Calaveras Cement Co., 315 Montgomery St., San Francisco 4, Calif.

Subject: **Great Lakes Projects**

Content: A 16mm sound-color film, *Men, Ships and Great Lakes,* gives a report on the work of Army Engineers in the interest of Great Lakes navigation. The St. Lawrence Seaway, on which the Corps of Engineers served as design and construction agents, is one of the film's highlights. Also featured are Upper Mississippi navigation and the Great Lakes connecting link—the Illinois Waterway and the Calumet-Sag Channel at Chicago. The motion picture is a non-technical film for public release. It was produced by the Corps' north central division at Chicago, Ill.

Where to get: U. S. Army Engineer district offices at Chicago; Buffalo, N. Y.; Detroit, Mich.; Rock Island, Ill.; and St. Paul, Minn. Also office of the chief of engineers, Washington, D. C.

FOR 50 YEARS...
Finest in the Field!
Rely on the bucket contractors rely on. The Omaha Dragline Bucket gives full load with every cast. Perfect balance makes it easy to spot dump. Alloy steel cutting teeth stay sharp, tough and ready. Strike pay dirt now! Complete information and specifications await your letter.
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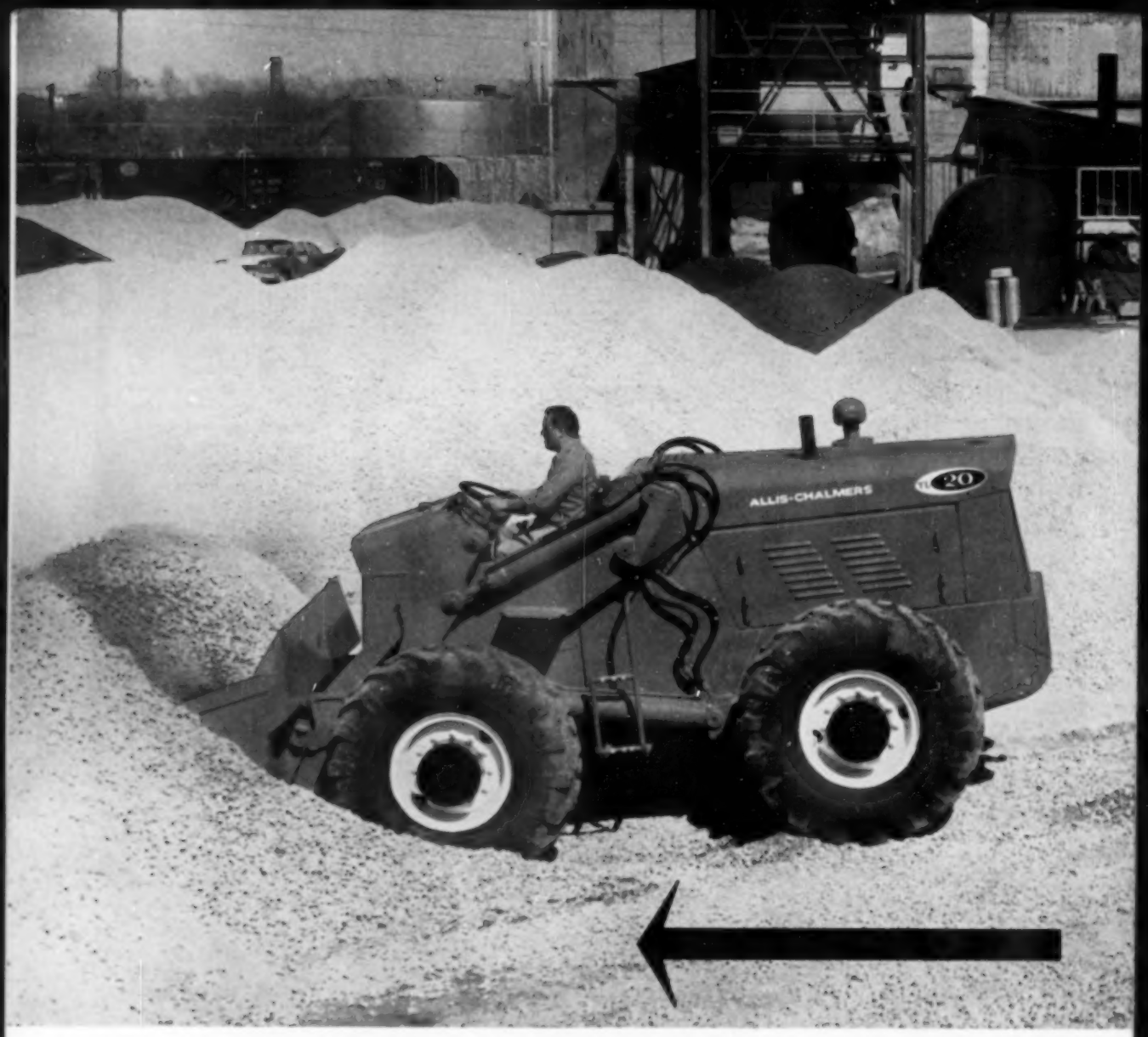

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You shift from any one gear to any other—forward or reverse . . . on-the-go. Allis-Chalmers tractor loaders make fast work far easier for any operator.

It's simple for a tractor loader operator to work faster—get more done. It's just as easy for him to go into a high gear as into a low gear—forward or reverse. ONE LEVER controls both speed and direction. No fumbling around with two or more levers or a combination of levers and foot pedals.

Besides operating simplicity, a tractor loader has *firmly connected axles*—attached to frame with 2-inch diameter steel pins . . . no rolling and shifting under load. *Extra stability* lets operators get and deliver

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SINGLE-LEVER SHIFT

bigger loads with greater comfort. Add *extra reach* for fast, even dumping and you can see why production is higher with an Allis-Chalmers tractor loader. Let your dealer show you. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

The "Big Three" tractor loaders range in size from the TL-14 with 5,300-lb carry capacity to the TL-20 (shown) with 9,000-lb carry. Each has a family of buckets—18 bucket loader combinations in all.

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TO INQUIRE: Be sure to address your inquiry to the advertiser by using the listed address. If box number is used, mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

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HEAVY EXCAVATION EQUIPMENT
DRAGLINES, SHOVELS, CRANES, DRILLS, TRUCKS

15-W B-E elec. drag, 215', 12-yd.
450-W B-E diesel drag, 165' w/extra 10, 12, 13 & 14-yd. buckets.
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9-W B-E diesel drag, 165', 12-yd.
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7400 Marion diesel drag, 175', 13-yd.
7400 Marion elec. drag, 175', 12-yd.
1855 P&H diesel drag, 130', 10-yd.
625 Page diesel drag, 160', 9-yd.
621-S Page diesel drag, 125', 7-yd.
71-B B-E Crane w/160' boom.
200-W B-E diesel drag, 125', 6-yd.
2400 Lima elec. drag, 130', 6-yd.
2400 Lima diesel drag, 130', 6-yd.
4500 Manitowoc drag, 120', 5-yd.
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3900, 3500, & 3000 Manitowoc cranes.
111-M Marion drag, 100', 4-yd.
1601 Lima 4-yd. shovel/drag.
1055 P&H drag, 80', 4-yd.
1201 Lima dragline, 85', 3-yd.
54-B B-E drag, 80', 2½-yd.
5560 Marion 26-yd. elec. shovel.
190-B B-E 8-yd. elec. shovel.
151-M Marion 7-yd. elec. shovel.
1600 P&H 6-yd. elec. shovels.
170-B B-E 6½-yd. elec. shovel.
4161 Marion 6-yd. elec. shovel.
2400 Lima 6 yd. Std. & H.L. shovels.
120-B B-E 4-yd. elec. shovel.
1055 P&H 3-yd. H.L. shovel.
111-M Marion 4-yd. standard & H.L. shovels.
1201 Lima & 54-B B-E standard shovels.
#6 Northwest 1½-yd. standard shovel.
Model T-650 Reich drill truck mtd. rotary and down-the-hole.
Ingersoll-Rand truck mtd. & crawler mtd. Drillmasters.
Keystone #50 truck and mtd. Cardrill.
Euclid trucks, rear & bottom dump; dozers, etc.

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa.
GLadstone 5-3658

EUCLIDS
Rear, Bottom and Scrapers

12-yd. Bucyrus-Erie dragline.
9-yd. Bucyrus-Erie dragline.
6½-yd. Bucyrus-Erie shovel.
4-yd. Bucyrus-Erie shovel.
4-yd. Bucyrus-Erie dragline.
3-yd. Bucyrus-Erie shovel.
2½-yd. Bucyrus-Erie shovel and dragline.
1½-yd. Bucyrus-Erie shovel.
5-yd. Manitowoc dragline.
6-yd. Lima dragline and shovels.
Large stripping shovels.
Other equipment available, not listed above.

WILLIAM LUBRECHT, III
Construction Equipment
311 W. Diamond Ave. Hazleton, Pa.
Phone: GLadstone 5-4041 or 5-0523

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

Marion 151M #8850
Marion 482 #6353
Marion 492 #7494
Marion 4161 #8197
Bucyrus-Erie 54-B Diesel #95643
Bucyrus-Erie 54-B Diesel #103531
Bucyrus-Erie 120-B #62521
Bucyrus-Erie 120-B #15220

All equipment subject to prior sale.
Contact:

PICKANDS MATHER & CO.
Purchasing Department
780 Sellwood Building
Duluth 2, Minn.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

CLAMSHELL

Lorain 820, 2-yd. crane and clamshell, 65' boom, pendant supension, 34" tracks, Rudomatic tagline, Cat D13000 diesel engine, S/N 18523. Rebuilt and guaranteed. $33,000

HOES

Bucyrus-Erie 22-B S/N 69159, ¾-yd. hoe, 26" tracks. Buda gasoline engine. As inspected $12,000
Bucyrus-Erie 15-B hoe, S/N 50787, ½-yd. cap., 20" tracks. Buda gasoline engine. As insp. $7,500

TRUCK CRANES

Northwest #25 truck crane, S/N 12454, 40' boom, telescoping boom stop, outriggers and floats. Dart carrier, 10 Michelin 11.00x20 tires, gas engine. Good op. cond. As insp. $14,500
Orton truck crane, (S/N not available), ¾-yd. 25' boom, tagline, Ford V-8 engine, 6x6 carrier, I.H.C. engine. Op. cond. As insp. $4,000

HYDROCRANE ATTACHMENTS

Bucyrus-Erie ¾-yd. clamshell bucket with teeth for H-3 Hydrocrane—2 rams. Good condition $550
Bucyrus-Erie tagline reel, hose and fittings for H-3 Hydrocrane. Good condition .. $225

SHOVEL ATTACHMENTS

Bucyrus-Erie tunnel shovel attachment for 3-B, consisting of 15' boom, 12' handle, 1½-yd. dipper. Excellent cond. .. $4,500
Bucyrus-Erie 38-B boom section, 20' with pendants. Good condition $550
Northwest No. 25 fairlead attachment. Excellent condition $550
Lorain 820 fairlead attachment. Good condition $550

TRACTOR LOADERS

Caterpillar No. 933 Traxcavator, 13" std. tracks, crankcase guard, oil clutch, electric starter and a 1-yd. bucket. Reconditioned, 30-day Bonded Guarantee .. 29,500
Allis-Chalmers HD-16G Tractor-Loader, S/N 1309, 20" triple grouser tracks, crankcase guard, track roller guards, pull hook, 3-yd. bucket with teeth. Recond. 30-day guarantee $19,500
Allis-Chalmers HD-9G Tractor-Loader, S/N 1079, 16" tracks, cc. guard, elec. starter, Tractomotive TS9 2-yd. bucket with teeth. Recond.—30-day Guar. $12,500
Allis-Chalmers HD-5G Tractor-Loader, S/N 7976, 13" tracks, cc. guard, elec. starter, 1-yd. bucket. Good op. cond. As insp. $6,500

H. O. PENN MACHINERY CO., INC.
140th St. & East River New York 54, N.Y.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

3—Allis-Chalmers model HD-6G Tractor Shovels with 1½-cu. yd. buckets. All three of these machines have been completely reconditioned in our shop and carry 90-day guarantees.
2—Caterpillar D4 tractors with 1-cu. yd. hydraulic loaders. All necessary repairs have been made to these machines and they are ready to go.
TD-18 International tractor with double-drum cable control unit and cable dozer. Has GMC diesel engine. An older tractor in fair condition. Cheap.
Bucyrus-Erie model 38-B combination crane, clamshell and dragline. Has 80' boom, mast, pendant suspension long wide tracks, third drum. This 38-B is in excellent condition, ready for any job.
Bucyrus-Erie model 22-B clamshell and crane. Has GMC diesel engine, 40' boom, standard tracks. This machine is in very good condition.
Lorain ¾-cu. yd. dragline. Has 50' boom, new GMC diesel engine. All necessary repairs have been made and machine is ready to go.
Quick-Way ¾-cu. yd. truck mounted hoe. Condition good, priced cheap.
Cleveland model 110 Trencher with 16" buckets, 21½" cut, crumbing shoe. Has new bucket line and conveyor belt. Engine overhauled and balance of machine is in excellent condition.
Bucyrus-Erie H-3 Hydrocrane, 3-ton. Power take-off driven. Has new style boom, hydraulic bucket and tagline reel. Good condition.

D. D. KENNEDY, INC.
P. O. Box 177
Bellwood, Ill.
AUstin 7-4300 LInden 4-5600

Lorain TL-20 combination crane and shovel with Cat D311 diesel engine. Ser. #18085. Price, f.o.b. Asheville, N. C. $4,500
Lorain TL-25S shovel with Cat D315 diesel engine. Serial #25164.
Price f.o.b. Charlotte, N. C. $8,000
Northwest model 80-D shovel with 2½-cu. yd. Esco bucket, 30" treads, model 21 Murphy diesel engine. Serial #13119.
Price f.o.b. White Haven, Pa. $19,500
Allis-Chalmers TS-360 motor scraper. Serial #1315.
Price f.o.b. Greensboro, N. C. $19,500

E. F. CRAVEN CO.
P. O. Box 3307 515 S. Eugene St.
Greensboro, N. C.

38-B straight boom 1½-cu. yd. hoe attachment.
54-B bare boom, 60-ft., no point sheaves. In excellent condition.
Northwest model 25 shovel with Caterpillar diesel engine. Serial No. 9288.
Koehring model 205 shovel and hoe, ½-yd., serial No. 5262C, powered with International gas engine #17366. 1948 model.
Lorain model L-41 hoe with Waukesha gas engine. Serial No. 17832.
Unit model 1020 ¾-cu. yd. shovel, serial No. 51256, powered with Chrysler gas engine.
Insley K12 ½-yd. backhoe, serial #3671, powered with Buda engine.

CLYDE EQUIPMENT CO.
3410 First Ave., South
Seattle 4, Wash.

Bucyrus-Erie 22-B Transit Crane, serial #119035. Two years old, excellent condition, less than 2,000 miles on speedometer. Located in Benton, Pa. Price $27,500.

CLEVELAND BROTHERS EQUIPMENT CO.
Route 309 Wilkes-Barre, Pa.
Phone: VAlley 2-8141

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Insley model ¾-yd. backhoe attachment. $1,200 FOB Elizabethtown, Ky.

Lorain model TL-20 dragline with 45′ boom, Waukesha gas engine. Undercarriage rebuilt. Good operating condition. $7,000 FOB Evansville, Ind.

General model 307, ¾-yd. dragline with 45′ boom and fairleads. Powered by Waukesha gasoline engine. $7,000 FOB Evansville, Ind.

Bucyrus-Erie model 15-B, ½-yd. dragline with 40′ boom, fairleads. Powered by IHC UD9 diesel engine, ½-yd. dragline bucket. $9,500 FOB Evansville, Ind.

Unit ½-yd. capacity shovel, powered by Chrysler Industrial gasoline engine. $3,750 FOB Evansville, Ind.

Write—Wire or Phone Jim Waddell

BRANDEIS MACHINERY & SUPPLY CO.
P. O. Box 1705 **MElrose 7-4741**
Louisville 1, Ky.

Lima model 34 crawler-mounted clam-digging-hoe combination, Buda gas engine, 35′ boom, dragline fairlead, tagline reel, hoe boom with dipper. Priced to sell. Will sell with one or both attachments.

Unit model 357 rubber-tired wagon crane, equipped with new Chrysler Industrial engine, 25′ boom, tagline reel, overhauled machinery, repainted, excellent condition.

Lorain model 55 crawler-mounted shovel, equipped with UD-18 I.H.C. diesel engine. 25-ft. boom, tagline reel, overhauled machinery, operating condition.

Bay City model 45 crawler-mounted dragline-clamshell machine, equipped with Cat D4600 diesel engine, long crawlers, 45′ boom, tagline reel, dragline fairlead.

Gradall model 2460. New in 1957, equipped with G.M.C. Series 3C3C diesel engine on upper works. Mounted on Duplex 6 x 4 truck carrier. Included are 24″ and 36″ digging buckets and frost ripper. Machine in excellent condition and priced to sell at $18,000 our yard. No trades on this special.

Bucyrus-Erie model 22-B crawler-mounted hoe. Powered with Cat D318 diesel engine, long frames and wide treads. Cambered type hoe boom, ¾-yd. hoe dipper. Machine new in late 1955. Excellent condition.

Bucyrus-Erie model 22-B crawler-mounted hoe or crane. Powered with Cat D318 diesel engine, long cats, 30″ crawler treads. Machine new in late 1955. Excellent condition.

Bucyrus-Erie model 11-B demonstrator 10-ton Transit Crane, equipped with up to 70′ of boom. Six wheel drive carrier. Hoe equipment also available. Like new condition.

Northwest model 80-D shovel. Good working condition. Call or write for more details.

Lorain model 80-J crawler-mounted crane. Write for more details.

HYDROCRANES

Model H-2 Bucyrus-Erie Hydrocrane mounted on a Chevrolet truck chassis, equipped with 2-piece boom, rear outriggers, reel and bucket available. Priced to sell at $2,500 at our yard.

Model H-5 Hydrocrane, 1953, mounted on G.M.C. truck chassis. 2-piece telescopic boom, tandem outriggers, operator's cab, tagline reel, hose, ⅝-yd. Hydrocrane clamshell bucket. Recently overhauled. Very good condition.

Model H-3 Bucyrus-Erie self-powered Hydrocrane, 1955, mounted on Army surplus six-wheel drive carrier powered with G.M.C. engine. 2-piece telescopic boom, operator's cab, tandem outriggers, tagline reel with hose, ⅝-yd. clamshell bucket. Ford 4-cylinder Industrial engine on Hydrocrane upper works. Very good condition.

Model H-3 Hydrocrane, 1952, mounted on Ford truck chassis, equipped with 2-piece telescopic boom, operator's cab, tagline reel, ⅝-yd. clamshell bucket. Very good condition.

Model H-3 self-powered Hydrocrane, 1957, equipped with 2-piece telescopic boom, tandem outriggers, operator's cab with heater, reel and new style ⅝-yd. twin-ram clamshell bucket, mounted on I.H.C. S-172 truck chassis. Complete machine in like new condition at a reduced price.

J. P. WAITE, INC.
3304 W. Pierce St. **Milwaukee, Wis.**
EV. 4-1900

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie model 10-B dragline, serial No. 88595, with Buda gasoline engine, 28′ crane boom. Good working condition $3,500

Bucyrus-Erie model 22-B combination clamshell & crane, serial No. 104362, with Caterpillar D318 diesel engine, 50′ boom, counterweights. Being rebuilt in our shop.

Bucyrus-Erie model 38-B 1½-yd. shovel, serial No. 112162 with Caterpillar D13000 diesel engine, Kohler light plant, standard crawlers with 33″ treads. Location—northern New Jersey.

Bucyrus-Erie model 51-B 2½-yd. shovel, serial No. 62581 with Caterpillar D17000 diesel engine, standard crawlers with 36″ treads. Low hours. Reconditioned and in very good condition throughout.

Bucyrus-Erie model 54-B 2½-yd. shovel, serial No. 22854 with Buda diesel engine, standard crawlers. Machine in working condition. Location—northern New Jersey $15,000

Unit model 614 ½-yd. backhoe, serial No. 50062 with 2-71 G.M.C. diesel engine. Good condition throughout $7,850

Unit model 617 ⅝-yd. cambered boom backhoe, serial No. 54125 with G.M.C. diesel engine with torque converter, extended crawlers with 22″ treads. Reconditioned throughout $10,500

Bay City model 45 ¾-yd. backhoe, serial No. 5993 with Caterpillar diesel engine, standard crawlers. Reconditioned and ready to work $13,750

Northwest model 25 ¾-yd. backhoe, serial No. 16381 with Caterpillar D318 diesel engine. Only 2,800 hours use. Reconditioned and ready to work $16,750

Byers model 83 heavy-duty lifting crane and dragline, serial #1885, Hercules gasoline engine, extended crawlers with 30-in. treads and additional counterweights. 40′ boom. Excellent condition throughout, used only 968 hours. Outstanding value. $8,500

Lima model 802, year 1949, serial No. 5145. Caterpillar D17000 diesel engine, Kohler light plant, combination dragline and clamshell, 60′ boom, extended crawlers, 36″ treads. Recently completely rebuilt $39,750

Lima model 1201, year 1954, serial No. 329514. Cummins L1 diesel engine, Kohler light plant, combination dragline, clamshell, 80′ boom, high gantry, extended crawlers, 40″ treads. Good condition $63,500

Bucyrus-Erie Hydrohoe attachment for H-3 Hydrocrane complete with 18″ general purpose dipper, 20″ utility dipper, 12″ narrow dipper and all necessary fittings. Excellent condition. Complete $750

Bucyrus-Erie 22-B shovel front complete with dipper trip, chains and lagging. Good condition $1,500

Lorain ¾-yd. shovel front, Amsco bucket complete with dipper trip. Excellent condition throughout $1,500

Lorain 1-yd. shovel front complete with dipper trip. Very good condition $2,000

Bay City 45 ¾-yd. shovel front complete with dipper trip. Good condition ...$1,500

BINDER MACHINERY CO.
Brighton St., Union, N. J.
MUrdock 8-0060

1—Link-Belt model LS-80 crane with 50′ boom, Rudomatic tagline, Buda gas, s/n 7074.

1—Link-Belt model LS-60 hoe, Buda gas engine, s/n 8128.

1—Bucyrus-Erie 10-B gasoline powered dragline, standard cats, excellent shape, s/n 20429.

1—Clark 10,000-lb. fork lift, solid tires.

1—Towmotor LT44 with pusher attachment on solid tires.

1—LeRoi 315 air compressor on 4 pneumatic tires, 7 or 8 years old.

1—Ruhr M-1—½-yd. heavy-duty grapple, new.

1—Wayne 36″ rider industrial vacuum pick-up sweeper, demonstrator, 2 years old.

2—G2°C Jetcretes with all accessories. Excellent condition, practically new with all extra accessories.

1—Used Kennedy-VanSaun revolving scrubber washer screen, 48″ dia. x 21′0″ long, in excellent shape and complete with all new parts including extra scrubber sections and new sizing screens.

S. M. CHRISTHILF & SON, INC.
Timonium Road and Harrisburg Expressway
Timonium, Md.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie 38-B Shovel and Dragline #73300 with Cat D13000 engine, 33″ standard mounting, 50′ dragline boom, counterweight and pendant suspension. Good condition $24,000

P & H 255 ATC Transit Crane #18053, with D315 Cat engine on crane, 60′ boom and backstops. Carrier model TC 3578 with tandem dual 11:00-20 tires and outriggers and Cummins JT6B engine. Excellent condition $29,500

Koehring 304 Shovel and Dragline #C4857, ¾ yard dipper, GMC diesel engine, 45′ dragline boom. Good condition $9,500

Yaun Model DL 2 yard Dragline Bucket #4338, complete with teeth, dragchains and dump sheave. New condition $950

McKiernan-Terry 11B3 Double Acting Pile Hammer with #3 anvil block for 14″-16″-18″ piling and 60′ leads. Good condition. $7,500

Also

Cat D8 Tractor #2U 8250 SP with #25 C.C. and 8S Dozer. Fair condition $4,950

All F.O.B. Albuquerque subject to prior sale or other disposition

HENRY THYGESEN CO.
Box 876 **Albuquerque, New Mexico**
CH 2-2377

EXCAVATORS

1—Lima 604 1½-yd. shovel, Cummins HIS diesel power, machine has been shop checked and minor repairs made. Located at Casper. Priced right.

1—Lima model 34 dragline powered by Caterpillar D318 engine. Machine is being priced as is where is. Chance for a real bargain.

1—Backhoe attachment for Lima 34 in very good condition. Can be adapted to other machines of this class.

1—Byers model 83-CC crane, 20-ton rating, mounted on Hendrickson crane carrier model 500E. Crane is equipped with 80′ boom. Located at Phoenix.

1—Bucyrus-Erie 10-BTC equipped as hoe and dragline, powered by gas engine. A clean machine and priced right.

1—Lima 604 shovel, powered by Cummins HIS diesel engine. There is a lot of production left in this machine and it is priced for a quick sale. Located at Casper.

1—Lorain TL-25 hoe, a wide-track machine in nice condition powered with Caterpillar D318 engine.

1—Link-Belt LS-71 equipped as a dragline powered by Int. UD14A engine, 45′ boom with pendant suspension.

ASPHALT EQUIPMENT

1—848 Barber Greene asphalt plant, equipped with feeder, bucket elevators, rotary drier, gradation unit, dust collector, pug mill, Cleaver Brooks steam boiler, G. M. model 4-71 engine, Caterpillar model D13-000 engines, also electric motors, wiring cables and panels that make this plant complete. Checked and serviced in our Denver yard.

TRUCKS, SCRAPERS AND BOTTOM DUMPS

3—LeTourneau Super C Tournapulls, tires range from fair to good. These machines are workwise, bargains. Located at Casper.

2—Allis-Chalmers TS-300 scrapers powered by 6-71 GM diesel engines. Priced for quick sale.

2—Euclid model 23TDT bottom-dumps, with GMC 6-110 engines. Allison Torqmatic transmissions. New in 1957. Very good appearance. Located in Los Angeles.

2—Euclid model 91FD rear dumps, 15-ton capacity. New in 1958. Priced for quick sale. Located in Los Angeles.

8—WD-60 Koehring Dumptors, GM diesel engines, 18:00x24 drive tires, 10:00x20 steering tires. Good to very good condition.

TRACTORS

1—Caterpillar D8, late 20 series, oil clutch U8 dozer, model 25 cable control unit track system and engine overhauled recently. A good buy.

1—Allis-Chalmers HD-19, front pusher plate, and rear pusher block, 26-in. track shoes. A bargain as is.

MISCELLANEOUS EQUIPMENT

1—Model 200 Parsons trencher, powered by UD9 Int. engine, 21″ wide buckets, crumber and cab.

1—Woods Roadmixer model 54 powered by Chrysler industrial engine P.T.O. for DS.

THE COLORADO BUILDERS' SUPPLY CO.
1334 Blake Street **Denver 2, Colo.**

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie 38-B shovel 1½-yd. Serial No. 101377 with Cat D13000. Very good condition. $31,000.

Bucyrus-Erie 38-B crane-clamshell-dragline combination. Serial No. 45797 GMC 6-71 engine, 75' boom, long and wide crawlers. Very good. $22,500.

Bucyrus-Erie 22-B heavy-duty crane-clam-backhoe combination. GMC 3-71 diesel, serial No. 119806. Less than 400 hours, like new. Combination hoe and crane. $30,000. Hoe or crane only $27,500

Lorain 41 shovel, ¾-yd. Cat D4600 engine, serial No. 14597 ..... $8,200

Unit 10-20 truck crane, ¾-yd., serial No. 49049. GMC 3-71 diesel mounted on Dart carrier, 30' boom. Good condition ..$11,950

Vibro-Plus CH-30 compactor. 3.5 tons, dynamic impact 7 tons. Waukesha diesel. Demonstrator, like new $7,500

Kiesler 1½-yd. rehandling clam with counterweight type H. Like new. $1,900.

Esco ¾-yd. orange peel model 379. Excellent $2,125

American double-drum sheepsfoot roller, model AD96 with wedge type feet, 48" width drums, diameter 60" good condition. $2,000

Northwest model 25 backhoe, ¾-yd. Caterpillar D4600 engine, very good condition. $14,500

International model 300 tractor with Wain-Roy backhoe, model H700. 12" bucket, both 1956 models in excellent condition ..$3,750

Wooldridge model BB120, 14 to 18-yd. scraper, tires 18:00 x 24—65% of new. Scraper in good condition $2,500

Scoopmobile model H, ¾-yd. loader. 1955 model, excellent condition, demonstrator unit, with Chrysler gasoline engine..$4,900

Scoopmobile model C, with 22' tower and pallet forks, with ¾-yd. bucket, excellent condition. Chrysler gasoline engine. Capacity 4,000 pounds $3,900

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Used reconditioned dipper stick assembly, new racking, including end casting—$1,500. Used 2½-yd. reconditioned Type VII shovel dipper with bail, padlock and teeth—$2,500. Used 3-yd. Esco Mesabi shovel dipper with bail, padlock, teeth and extra door—$2,500.

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NOTES from the Manufacturers

American Cyanamid Co., Bound Brook, N. J., has appointed B. R. Putnam as manager of its explosives and mining chemicals department. Putnam will direct commercial operations related to the marketing of explosives and mining chemicals from headquarters in New York. A director of the Chemical Market Research association, Putnam has been with Cyanamid since 1947.

Bucyrus-Erie Co., South Milwaukee, Wis., has appointed Contractors' Equipment & Supply Co., 707 Broadway, N. E., Albuquerque, N. M., as distributor in the state of New Mexico. The firm offers sales and service on the full line of convertable crane-excavators; dragline buckets; Transit machines; and all-hydraulic Hydrocranes. In another distributor appointment on the east coast, Bucyrus-Erie announces that Mott-Manbeck Machinery Co., Inc., Box 466, Latham (Albany), N. Y., will carry commercial cranes and excavators in addition to Hydrocrane equipment. The firm provides sales and service to east central New York.

Cleveland Trencher Co., Cleveland, Ohio, has appointed J. Rowland Doyle as chief engineer. Doyle is a graduate mechanical engineer of the University of Toronto. He is an active SAE member, and a registered professional engineer. He comes to Cleveland from the Oliver Corp., where he has held the position of assistant chief engineer.

McKiernan-Terry Corp., Dover, N. J., has appointed Central Equipment Co., Minneapolis, Minn., as distributor for its construction equipment products within Minnesota and parts of Wisconsin and Michigan. R. H. Nelson, formerly manager of sales and service for McKiernan-Terry's Construction Equipment division, has been associated with the Central Equipment Co. since last fall as vice president.

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